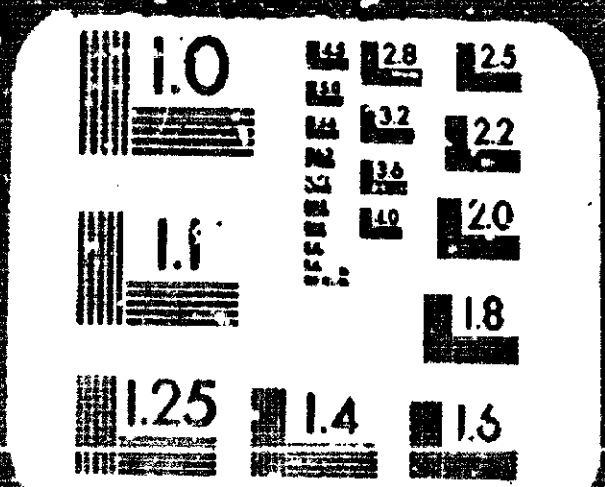

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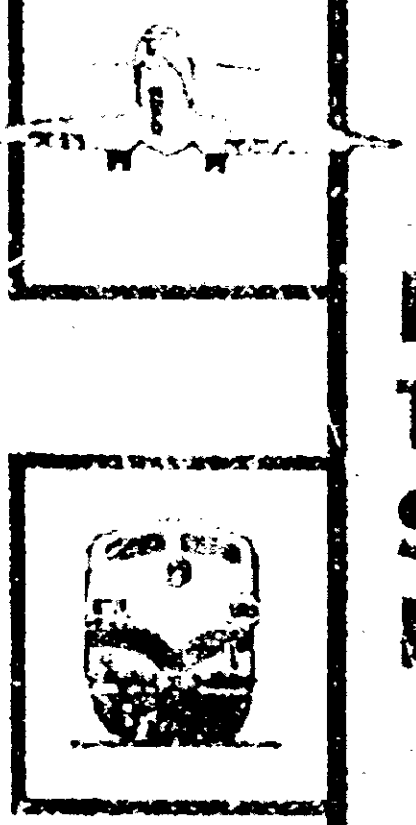
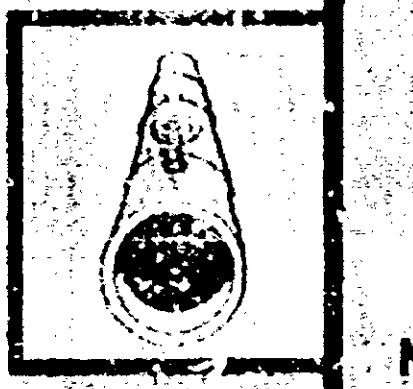


NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C. 20594

SAFETY EFFECTIVENESS EVALUATION OF THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION'S RULEMAKING PROCESS

VOLUME 3 -- CURRENT RULEMAKING



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16. Abstract

This report presents an overview of all current rulemaking activities which are associated with motor vehicle safety standards. It describes the formal procedures which govern the National Highway Traffic Safety Administration's development of Federal motor vehicle safety standards, and examines eight standards which illustrate the rulemaking process. The emphasis in this study will be on rulemaking from the point at which a safety need is identified and a rule first conceived to the promulgation of a final rule. Though the monitoring of rules, compliance testing, and enforcement will be mentioned, they will not be examined in detail in this report.

This case history, like its predecessors, presents an objective, factual account of NHTSA rulemaking procedures and activities, largely through description of specific examples. It does not contain analysis, but will help serve as a basis for the Safety Board's evaluation of the NHTSA's rulemaking process, to be published as Volume IV of the series. This case history was developed by the Safety Board through extensive interviews with NHTSA personnel, through examination of internal agency documents, including formal and informal documentation of specific rules, and through review of public dockets related to the standards. The NHTSA has had the opportunity to review and comment on a draft of this report.

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NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

SAFETY EFFECTIVENESS EVALUATION OF THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION'S RULEMAKING PROCESS

Adopted: February 15, 1980

VOLUME III: CURRENT RULEMAKING

INTRODUCTION

The Independent Safety Board Act of 1974 directs the National Transportation Safety Board to "evaluate, assess the effectiveness, and publish the findings of the Board with respect to the transportation safety consciousness and efficacy in preventing accidents of other government agencies. . . ." One way in which this mandate is fulfilled is by conducting "safety effectiveness evaluations" such as that currently being conducted on the rulemaking process of the National Highway Traffic Safety Administration (NHTSA). That evaluation, which will be completed in early 1980, will be based on three case histories of NHTSA rulemaking: Federal Motor Vehicle Safety Standard (FMVSS) 121—Air Brake Systems; 1/ FMVSS 208—Occupant Restraint Systems; 2/ and this survey of NHTSA rulemaking activities which are currently in progress. The evaluation will draw on the three case histories and other materials to analyze and assess the NHTSA's rulemaking process. The project responds to a request from the House Committee on Public Works and Transportation that the Safety Board conduct "an evaluation of truck braking standards and passive restraint systems . . .[and] evaluate the effectiveness of some of the activities and programs of NHTSA . . . ." 3/

Whereas each of the previous two case histories laid out in detail the events surrounding a single standard, this report presents an overview of all current rulemaking activities which are associated with motor vehicle safety standards. It describes the formal procedures which govern the agency's development of Federal motor vehicle safety standards, and examines eight standards which illustrate the rulemaking process. The emphasis in this study will be on rulemaking from the point at which a safety need is identified and a rule first conceived to the promulgation of a final rule. Though the monitoring of rules, compliance testing, and enforcement will be mentioned, they will not be examined in detail in this report.

1/ "Case History of Federal Motor Vehicle Safety Standard 121," August 2, 1979 (NTSB-SEE-79-4).
2/ "Case History of Federal Motor Vehicle Safety Standard 208," September 28, 1979 (NTSB-SEE-79-5).
3/ U.S. House of Representatives, Report No. 95-1169, Part 1, p. 3.

This case history, like its predecessors, presents an objective, factual account of NHTSA rulemaking procedures and activities, largely through description of specific examples. It does not contain analysis, but will help serve as a basis for the Safety Board's evaluation of the NHTSA's rulemaking process. This case history was developed by the Safety Board through extensive interviews with NHTSA personnel, through examination of internal agency documents, including formal and informal documentation of specific rules, and through review of public dockets related to the standards. The NHTSA has had the opportunity to review and comment on a draft of this report.

BACKGROUND

The NHTSA is an agency within the Department of Transportation (DOT). It was first established in April 1967 as the National Highway Safety Bureau (NHSB) to carry out the provisions of the National Highway Safety Act of 1966 and the National Traffic and Motor Vehicle Safety Act of 1966. Administrative action of the Secretary of Transportation placed that Bureau within the Federal Highway Administration (FHWA). On March 20, 1970, the Secretary separated the Bureau from the FHWA and established it as one of the administrations of the Department, reporting directly to the Secretary. The Highway Safety Act of 1970 confirmed this action, renaming the agency the National Highway Traffic Safety Administration.

The NHTSA is responsible for establishing and enforcing national standards for improving safety in the operation and performance of motor vehicles and equipment. The agency's authority for this mission derives from the National Traffic and Motor Vehicle Safety Act of 1966 (Safety Act of 1966). 4/ A motor vehicle safety standard is defined in the Act as "a minimum standard for motor vehicle performance, or motor vehicle equipment performance, which is practicable, which meets the need for motor vehicle safety and which provides objective criteria."

The Safety Act of 1966 authorizes additional activities on the part of the NHTSA, such as vehicle defect investigations and research development. Also in 1966, under the National Highway Safety Act, the NHTSA was given authority to administer a grant-in-aid program to enhance the States' ability to implement traffic safety improvements. Under more recent legislation, the NHTSA is charged with the development of Federal standards in such other specific areas as bumper performance, odometer integrity, and fuel economy. This case history, however, is restricted to rulemaking of the NHTSA for motor vehicle safety standards authorized by the Safety Act of 1966.

Under the Safety Act of 1966, the Secretary of Transportation and his or her delegate, in prescribing safety standards, is to:

4/ P.L. 89-563, September 9, 1966; 15 U.S.C. 1381 et. seq.

(1) consider relevant available motor vehicle safety data, including the results of research, development and evaluation activities conducted pursuant to this [Act];

* * * * *

(3) consider whether any such proposed standard is reasonable, practicable and appropriate for the particular type of motor vehicle or item of motor vehicle equipment for which it is prescribed; and

(4) consider the extent to which such standards will contribute to carrying out the purposes of this [Act].

To carry out this mandate, the Secretary of Transportation is granted specific authority to conduct research, testing, development, and training in traffic and vehicle safety. This includes, but is not limited to:

(1) Data collection "from any source for the purpose of determining the relationship between motor vehicle . . . performance characteristics and (A) accidents involving motor vehicles, and (B) the occurrence of death or personal injury resulting from such accidents;"

(2) obtaining experimental vehicles and equipment for testing; and

(3) selling or disposing of those vehicles or equipment.

According to the legislative history of the Act, the intent of these provisions is to establish a motor vehicle technological capacity for the Federal Government:

> The Federal Government must develop a major independent technical capacity sufficient to perform comprehensive basic research on accident and injury prevention, adequate to test and contribute to the quality of the industry's safety performance; a technical capacity capable of initiating innovation in safety design and engineering and of serving as a yardstick against which the performance of private industry can be measured; and finally, a technical capacity capable of developing and implementing meaningful standards for automotive safety. 5/

One of the concerns expressed in the legislative history of the Act is that safety standards should set performance criteria and not be design-oriented. Regulations are expected to be performance standards, "specifying the required minimum safe performance of vehicles but not the manner in which the manufacturer is to achieve the specified performance. . . ." The intent behind this requirement is to ensure that the safety standards allow room for competition and do not "stifle innovation in automotive design."

5/ 1966 U.S. Code Cong. and Adm. News, p. 2712.

The Secretary of Transportation is directed to consider the reasonableness and appropriateness of any proposed standard. "The Secretary is not expected to issue a standard covering every component and function of a motor vehicle, but only for those vehicle characteristics that have a significant bearing on safety." In addition, the following specific intent is described in the legislative history:

> The committee intends that safety shall be the overriding consideration in the issuance of standards under this bill. The committee recognizes . . . that the Secretary will necessarily consider reasonableness of cost, feasibility and adequate lead time.
>
> In determining whether any proposed standard is "appropriate" for the particular type of motor vehicle equipment or item of motor vehicle equipment for which it is prescribed, the committee intends that the Secretary will consider the desirability of affording consumers continued wide range of choices in the selection of motor vehicles. 6/

The basic intent and authority expressed by the Safety Act of 1966 remain in effect to this date. Refinements and specific interpretations have been made through the years by legislative amendments and the resolution of litigation. However, the general purpose and objectives of the Act still provide the guidance used by the NHTSA to issue Federal motor vehicle safety standards.

This report consists of two sections and an appendix: Part I discusses in detail the formal rulemaking procedures of the NHTSA; Part II describes eight individual standards as illustrations of rulemaking activity; Appendix A outlines all of the NHTSA's motor vehicle safety standards. Before beginning Part I, a brief outline of the structure of the NHTSA will be presented to outline the organization within which rulemaking takes place. 7/

The NHTSA is headed by an Administrator who has overall responsibility for the development and implementation of agency programs and who reports to the Secretary of Transportation. Within the NHTSA there are five elements which are most directly concerned with the establishment of motor vehicle safety standards: Rulemaking; Research and Development; Plans and Programs; Enforcement; and the Office of the Chief Counsel. Each of these elements, with the exception of the Office of the Chief Counsel, is headed by an Associate Administrator who supervises the activities of that element and reports to the Administrator. A brief description of each of these elements follows (see figure 1):

(1) Rulemaking: Rulemaking, and within this element the Office of Vehicle Safety Standards, is the center of motor vehicle safety standard activity. The office prepares the initial documentation for a rule, generally called a Rulemaking Support Paper. This includes presenting data describing a safety problem, analysis of

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6/ Ibid., p. 2714.

7/ The basic structure of the NHTSA and the functions of its elements are established in DOT Order 1100.12A and NHTSA Order 110.8.

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
HEADQUARTERS

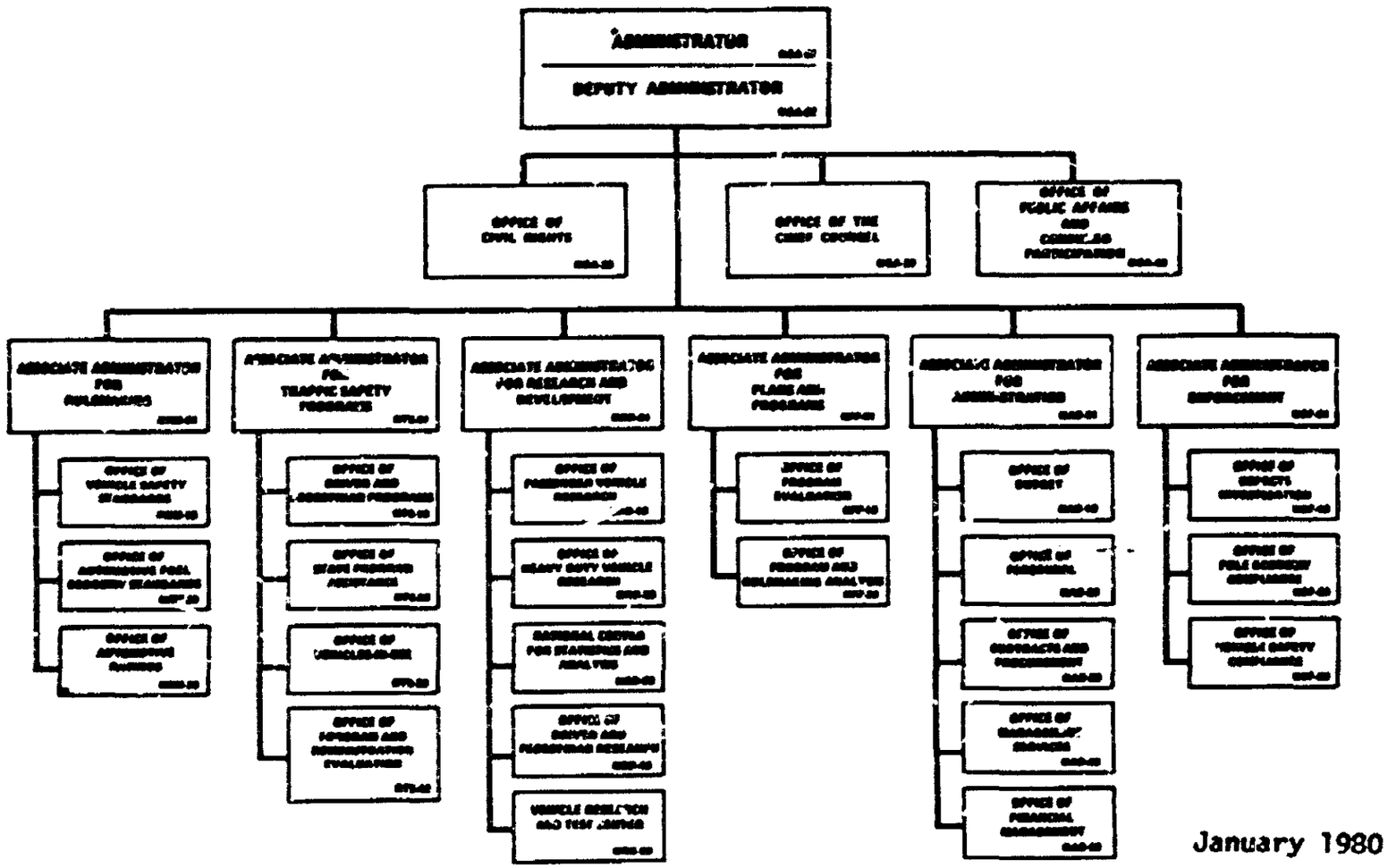

Figure 1.—NHTSA organizational chart.

potential countermeasures to reduce injury and death related to the problem, estimating benefits and costs associated with the potential standard, and writing a first draft of the proposed regulation. In addition, the office bears the primary responsibility for responding to petitions concerning safety standards currently in effect.

(2) Research and Development. This office directs research associated with development of potential regulations. It works closely with Rulemaking, and projects of both offices are coordinated through the Five Year Plan (described in more detail on pages 19-21), which focuses research in areas in which the agency determines rulemaking is most needed. An engineer in Research and Development and a counterpart in Rulemaking are assigned to coordinate each standard or proposed regulation. Included among the elements of Research and Development are the National Center for Statistics and Analysis and the Vehicle Research and Test Center.

(3) Plans and Programs. Plans and Programs is responsible for independently analyzing and evaluating the effects of proposed regulations. It reviews and questions proposals prepared by Rulemaking and, in particular, assesses the economic impact of a proposal. The office prepares a Regulatory Evaluation or, for regulations deemed "significant," a Regulatory Analysis, which analyzes the safety problem, proposed solutions, benefits and costs, and alternatives to the proposal. Plans and Programs is also responsible for evaluating standards after they have become effective and for managing the agency's planning process and Five Year Rulemaking Plan.

(4) Enforcement. Enforcement, through its Vehicle Safety Compliance Division primarily deals with a standard after it has become effective. However, the office reviews proposed rulemaking and may offer comment on proposed standards, particularly concerning compliance test procedures.

(5) Office of the Chief Counsel. The legal office works closely with Rulemaking and Plans and Programs in evaluating a proposed regulation in its legal context. The office is actively involved early in the rulemaking process reviewing the adequacy of Rulemaking Support Papers, and is eventually responsible for preparing all rulemaking proposals.

Finally, several terms associated with the NHTSA's rulemaking will appear throughout this report, and for the sake of clarity are defined at the outset:

The Five Year Plan: A plan published first in March 1978 and revised and updated in April 1979 that focuses the NHTSA's resources on approximately 40 rulemaking projects. It is accompanied by a "Research and Development Plan," a

detailed description and estimate of the Research and Development schedule and resources necessary to support each rulemaking project.

Rulemaking Support Paper: The initial documentation supporting and analyzing a rulemaking project. The Rulemaking Support Paper is prepared by the Rulemaking office and is an internal document which forms a basis for a formal notice. It is not generally released to the public.

Regulatory Evaluation or Regulatory Analysis: A paper prepared by Plans and Programs after a Rulemaking Support Paper has been written, to assess the effects of a proposed rulemaking, in particular to evaluate the costs and benefits associated with the proposal and alternatives to it. This analysis becomes part of the public docket when a notice, either an ANPRM or NPRM, is published.

Advance Notice of Proposed Rulemaking (ANPRM). A formal public notification, published in the Federal Register, announcing that the NHTSA intends to establish a rule. Generally, an ANPRM requests information for the development of a particular proposal and does not propose details of a rule.

Notice of Proposed Rulemaking (NPRM). A formal notice proposing a rule in detail and explaining the agency's reasoning for the rulemaking. The purpose of both an ANPRM and an NPRM is to afford the interested public an opportunity to comment on a proposed rule.

Docket. An NHTSA file containing comments submitted by interested parties regarding a proposed rule. Such comments may come from automobile makers, insurance companies, medical organizations, safety groups, consumer groups, legislators, government agencies (such as the Safety Board), or other organizations or individual citizens. In addition, the NHTSA includes in the docket that material which it wishes to make public concerning the proposed rulemaking.

Final Rule. After issuing an NPRM and considering the comments submitted to the docket, the NHTSA may issue a final rule or it may decide further changes are necessary and issue another proposal, or it may terminate the rulemaking. A final rule mandates the standard and establishes a date when the requirements of the regulation become effective.

Petition. Within 30 days after a rule is published, any individual or organization may request that the NHTSA reconsider its rule by filing a "petition for reconsideration." In addition, organizations or individuals may petition the agency to initiate rulemaking or to request exemptions from standards or parts of standards. The NHTSA may either grant or deny requests, but is required to consider all such petitions.

PART I

Rulemaking Procedures of the National Highway Traffic Safety Administration

The Safety Act of 1966 directs the Secretary of Transportation to "establish by order appropriate motor vehicle safety standards." The Safety Act of 1966 further specifies that the "Administrative Procedure Act [discussed on page 9] shall apply to all orders establishing, amending, or revoking a Federal motor vehicle safety standard under this subchapter." This part of our report describes the regulatory procedures used by the NHTSA to fulfill the mandate of the Safety Act of 1966. The chapter is divided into three sections: implementing procedures, internal NHTSA Orders, and other orders affecting the NHTSA's procedures. Each section discusses the requirements that the NHTSA is obliged to satisfy in promulgating safety standards.

Since the enactment of the Safety Act of 1966, the NHTSA has been assigned additional rulemaking responsibilities beyond the scope of safety standards, such as fuel economy. The agency has established specific internal procedures for meeting these new responsibilities but they are not applicable to the subject of this case history. The discussion which follows is restricted to the procedures related to rulemaking for motor vehicle safety standards.

Implementing Procedures

The Safety Act of 1966 directed the Secretary of Transportation to issue initial safety standards by January 31, 1967, and to revise those initial standards and issue new ones by January 31, 1968. Those initial standards and any subsequent revisions or new standards are to be issued using procedures listed in the Safety Act of 1966 and the Administrative Procedure Act.

Procedural Requirements of the Safety Act of 1966

The Safety Act of 1966 specifies certain procedural requirements for issuing safety standards. Safety standards are not to go into effect "sooner than one hundred and eighty days or later than one year from the date . . . issued, unless the Secretary finds, for good cause shown, that an earlier or later effective date is in the public interest, and publishes his reasons for such finding." The same requirement for lead time applies to amendments or revocations of any safety standard.

The Secretary is required to establish a National Motor Vehicle Safety Advisory Council of public and industry representatives and to "consult with the Advisory Council on motor vehicle safety standards. . . ." Safety standards are also subject to judicial review. Persons adversely affected by a standard are authorized to petition a U.S. Court of Appeals within 60 days after the standard is issued. The Safety Act of 1966 also authorizes the Secretary of Transportation to "issue, amend, and revoke such rules and regulations as he deems necessary" to carry out the required procedures. That authority has been interpreted to allow the NHTSA

to amend safety standards as a result of petitions for reconsideration. 8/ The Secretary of Transportation is authorized to temporarily exempt motor vehicles from motor vehicle safety standards under specific guidelines included in the legislation.

The legislative history of the Safety Act of 1966 clearly indicates the intent of Congress on many issues. For example, the Secretary of Transportation was expected to issue new and revised standards "on or before January 31, 1968, and thereafter at least once every 2 years, as Federal safety research and development matures. . . ." 9/

The issue of leadtime for standards is discussed as follows:

> The power to specify a later effective date is needed because it may become a practical economic and engineering impossibility, as well as a source of great hardship and unnecessary additional cost to require that all vehicle changes required by any new safety standard, whatever its scope or subject matter, be accomplished by all manufacturers for all their new vehicles within 1 year. When changes can reasonably be accomplished in 1 year or less, the Secretary can so require. But when manufacturers satisfy the Secretary that a particular change cannot reasonably be accomplished within 1 year, the bill gives him the discretion to extend the period, publishing his reasons therefor. . . ."

Regarding public comment on proposed standards, the legislative history states:

> The bill expressly includes as persons to be afforded an opportunity to participate in the standard-setting process, manufacturers, distributors and dealers of motor vehicles and motor vehicle equipment, public and private organizations, individuals engaged to a significant extent in the promotion or study of motor vehicle safety, and automobile insurance underwriters. . . .
>
> In issuing each standard, the Secretary is expressly required to publish a statement of basis and purpose which provides a nontechnical explanation sufficient to enable the public to understand the purpose and, where appropriate, the limitations of the standard's coverage together with a technical statement setting forth the data necessary to an evaluation of the standard by competent technical personnel. . . .

Requirements of the Administrative Procedure Act

The Administrative Procedure Act (APA) 10/ requires that general notice of proposed rulemaking be published in the Federal Register, unless those affected are personally served notice. That notice is required to include:

8/ Chrysler Corporation v. Department of Transportation, C.A. 6, 1972, 472 F. 2d 659.

9/ 1966 U.S. Code Cong. and Adm. News, p. 2713 et. seq.

10/ Sections 551, et seq. and 701, et seq. of Title 5, Government Organization and Employees.

(1) A statement of the time, place, and nature of public rulemaking proceedings;
(2) reference to the legal authority under which the rule is proposed; and
(3) either the terms of substance of the proposed rule or a description of the subjects and issues involved.

However, publication is not required if it would be "impracticable, unnecessary, or contrary to the public interest." In such cases, a statement to that effect is to be published along with the final rule. After issuing a Notice of Proposed Rulemaking, agencies are required by the APA to give interested parties an opportunity to express their views. This opportunity is specified as the "submission of written data, views, or arguments with or without opportunity for oral presentation."

The agency is required to consider relevant submissions and incorporate in the final rule "a concise general statement of their basis and purpose." The APA specifies that "the required publication or service of a substantive rule shall be made not less than 30 days before its effective date. . . ." Three exceptions to this requirement are authorized:

(1) A substantive rule which grants or recognizes an exemption or relieves a restriction;
(2) interpretative rules and statements of policy; or
(3) as otherwise provided by the agency for good cause found and published with the rule.

The APA also grants interested persons the right to "petition for the issuance, amendment, or repeal of a rule."

Internal NHTSA Orders

The NHTSA's internal procedures for rulemaking in the field of motor vehicle safety standards are contained in the NHTSA Order 800-1 series, first issued on November 7, 1972. These documents set forth the specific responsibilities of several NHTSA offices in the rulemaking process and specify the steps to be followed by them. On February 2, 1977, the NHTSA revised these procedures by publishing a new NHTSA Order 800-1. It remains in effect with the exception of one change which was issued on November 20, 1978. That change established a new NHTSA Order 800-2 specifying procedures for processing petitions. The NHTSA's current procedures, as detailed in the 1977 Order 800-1, are discussed in the following section.

Order 800-1 (February 1977)

NHTSA Order 300-1 describes in detail the procedures by which rules are to be developed, including a 17-step process of coordination and review. The Order establishes the policy that all rulemaking activities are to be based on "sound

problem identification and data analysis techniques giving due regard to societal costs." It also initiates a policy of at least yearly review of ongoing rulemaking for a "revalidation of initial assumptions, data analysis, costs and benefits."

The central coordinator of the procedure outlined in Order 800-1 is called the Rulemaking Program Director. 11/ Rulemaking begins when the Program Director prepares a Project Plan Description--an outline of a proposed project which includes the following: problem identification and magnitude; proposed solution; potential impact; description of required research; required resources; and an evaluation plan. The Plan Description is distributed to the pertinent elements of the NHTSA for comment. The Research and Development office is directed to include a draft research support plan in its comment and Plans and Programs is to identify the data needed for a Regulatory Analysis or Evaluation. The Program Director then submits the Plan Description and the comments received to the Administrator for review. The Administrator considers the Plan Description as well as the schedule for research, data collection, and makes any needed interim decisions.

The next step calls for the Program Director to prepare a Rulemaking Support Paper (RSP), which is to contain the following elements:

1. Title of Rulemaking,
2. Background,
3. Need (problem identification, magnitude, target group characteristics, type of vehicle or vehicle equipment affected -- expressed in quantitative terms to the extent possible),
4. Proposed Rulemaking Highlights (general description, rationale, aspects of performance sought to be improved and intended effect in performance terms),
5. Scheduling (leadtime requirements necessary for manufacturers to meet requirements and time between issuance of final rule or regulation and its effective date),
6. Reasons for Selected Approach (consideration of alternatives, consideration of technological feasibility, etc.),
7. Potential Benefits, Costs, and Other Impact (NHTSA Order ____) 12/
8. Potential Environmental Impacts (NHTSA Order 560-1) (including need to conserve energy),
9. Potential Reaction of Interested Parties,
10. Effect of Proposed Rulemaking on other Federal Motor Vehicle Standards (including fuel economy, safety, noise, air pollution, damageability),
11. Proposed evaluation plan to measure the effectiveness of the rule after its promulgation.

11/ The term "Rulemaking Program Director" is not used within the NHTSA. The official who functions in this capacity is usually the Associate Administrator for Rulemaking.

12/ An NHTSA Order on this subject was not issued.

The Rulemaking Support Paper is updated if the rulemaking becomes a final rule or is a continuation of prior rulemaking actions.

The Program Director also prepares an analysis of the costs, benefits, and other impacts of the rule as well as a statement considering "substantive statutory criteria" as they relate to proposed rulemaking. An example included in the Order provides an insight to the expected content of this statement:

> EXAMPLE: Motor Vehicle Safety Standards
> The substantive criteria in the National Traffic and Motor Vehicle Safety Act for the validity of motor vehicle safety standards are that the standards must "meet the need for motor vehicle safety" (102(2), 103(a)), be "reasonable" (103(f)) and "practicable" (102(2), 103(a), 103(f)), and be "appropriate for the particular type of motor vehicle or motor vehicle equipment" for which they are prescribed (103(f)).
>
> The standard will meet the need for motor vehicle safety.
>
> 1. The safety problem in the area the standard is designed to affect, expressed as far as possible in quantitative terms of deaths and injuries.
> 2. The aspects of performance sought to be improved by the standard, and the intended effect in performance terms.
> 3. The expected benefit flowing from the standard.
> 4. The correlation of the standard's requirements with the problem to achieve that benefit.
>
> The standard will be reasonable and practicable.
>
> 1. The costs that must be incurred in meeting the standard.
> 2. The technology that is available, or that may reasonably be developed, to meet the requirements of the standard.
> 3. The leadtime (or lack of it) that is necessary for manufacturers to prepare to meet the requirements of the standard, and the actual time planned to elapse between the issuance of the final rule and its effective date.
>
> The standard will be appropriate for the particular type of motor vehicle equipment for which it is prescribed.
>
> The range of vehicle types, sizes, and variations that will be covered by the standard, and the appropriateness of applying the standard to vehicles within that range, with particular reference to any categories for which the appropriateness might be questioned.

The document or documents which constitute the Rulemaking Support Paper, along with a Regulatory Analysis or Evaluation drafted by Plans and Programs, are consolidated in the "Draft Package." However, if the documents do not support continuation of the rulemaking action, the Program Director must modify the rule and attempt to reach an agreement with Plans and Programs. If this cannot be done, the matter goes to the Administrator for resolution.

The Rulemaking Program Director distributes the "Draft Package" to the pertinent elements in the NHTSA and to the Director of the Bureau of Motor Carrier Safety (BMCS) of the Federal Highway Administration (FHWA) for comment. After any modification required by these comments is resolved, the "Draft Package" is forwarded to the Administrator for approval and then to the Chief Counsel for preparation of a final draft.

The next step in the evolution of a rule is the preparation of the "Approval Package." The Chief Counsel prepares a draft of the rulemaking for publication in the Federal Register and a "highlight memorandum." The memorandum includes a summary of the "major issues, expected reaction from interested parties, effective dates and comment period (in the case of proposals) and a statement of the recommended treatment of the actions under E.O. [Executive Order] 11821 13/ and the Secretary's policies. This "Approval Package" is distributed to the pertinent elements of the NHTSA and to the BMCS for comment.

When comments are received, the Program Director modifies the Rulemaking Support Paper, the Chief Counsel modifies the draft and "highlight memorandum," and Plans and Programs modifies the analysis or evaluation. In addition, the Program Director prepares a memorandum summarizing the comments. These documents collectively become the "Signature Package" and are forwarded to the Administrator for approval. After signature by the Administrator, the Chief Counsel arranges for publication of the rulemaking in the Federal Register.

If the rulemaking action is being expedited, the Rulemaking Program Director must demonstrate to Plans and Programs and the Chief Counsel that:

1. There is a time constraint.
2. Environmental effects are small and an Environmental Review Report is in progress with estimated completion date.
3. Economic impact [is] not expected to be "major," and impact analyses are being prepared for P&E [Plans and Programs] review with estimated completion date.
4. External coordination [is] not required or informally initiated.
5. Alternatives to the intended approach are not reasonable.

Under those procedures, no Project Plan Description or Rulemaking Support Paper is required. The next step after this memorandum is the preparation of the "Approval Package." Abbreviated procedures are also provided for "Non-Substantive Rulemaking," such as correcting errors, giving notice of a public meeting, and making routine additions of tire size designations to FMVSS 109 and 110.

NHTSA Order 800-1 also specifies a "Procedure for Processing Petitions." That procedure calls for all petitions to be handled as "controlled correspondence," with action on the petition required within 120 days of receipt. The steps for

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13/ Executive Order 11821 requires the preparation of inflationary impact statements under specific conditions.

processing a petition are determined by the Rulemaking Program Director based upon the nature of the petition, an analysis of any material submitted with it, and information already possessed by the agency for making a decision. Processing points are included in flow charts attached to the Order.

The Rulemaking process detailed in Order 800-1 is a complex one which is designed to coordinate the activities of Rulemaking, Research and Development, Plans and Programs, and the Office of the Chief Counsel. In a memorandum accompanying the Order, the NHTSA Administrator in early 1977 expressed an overall sense of the interrelationships between the various NHTSA offices:

> 800-1 will . . . clarify the authority and responsibilities of the various offices. I see [Plans and Programs] having the most significant role, both in inceptional and pending rulemakings, in taking a lead as independent questioner and critic to assure that all available alternatives are fully fleshed out and considered. From the [Project Plan Description] stage on through the draft and final [Rulemaking Support Papers], [Plans and Programs] must assess the alternatives and impacts. [Plans and Programs] must bring independent and objective scrutiny to these matters. Similarly, although the Chief Counsel will continue to provide drafting, interpretive and other services regarding the statutes, regulations and standards, such services provided to a particular [Rulemaking Program Director] are, of course, subordinate to the fundamental responsibility to independently advise the Administrator on accomplishment of the agency's mission in a manner that conforms to applicable law and regulations.
>
> Finally, I see [Research and Development] as a coequal partner with [Plans and Programs], [Office of the Chief Counsel], and the [Rulemaking Program Director] in the development of the improved rules. Although [Research and Development] will furnish the necessary support to the [Rulemaking Program Director] it will approach this task in an independent, objective and scientifically professional manner. Clearly, it is a two-way street that goes between [Rulemaking Program Director] and [Research and Development]. The work product of [Research and Development], as much as anything else, may well, and should give, assistance and direction to the rulemaking activity. Finally, although the grant of comprehensive authority for action is given to the rulemaking offices, it cannot be overemphasized that 800-1 fittingly demands that the [Rulemaking Program Director] accept proportionate responsibilities to secure the best data and analysis available in order that all of my advisors can assist me in the most independent and objective manner in arriving at the most meaningful rulemaking decision.

Other Internal NHTSA Orders

The NHTSA has also issued several other internal Orders directly related to rulemaking on motor vehicle safety standards. One such Order describes procedures for evaluating the impact of a proposed regulation on the environment. 14/ Another sets forth procedures for considering inflationary

14/ NHTSA Order 560-1 dated November 20, 1972.

impacts of regulation, as directed in Executive Order 11821. 15/ A third Order describes postruc valuation plans 16/ and states as NHTSA policy: "No programs and projects will be undertaken without an evaluation plan, prepared and coordinated in accordance with procedures in this Order." The Order goes on to specify that,

> Evaluation "plans need not be separate documents. Information elements required for evaluation plans . . . may either be incorporated into multiyear and budget execution plans, detailed work statements, and contractors' proposals for evaluation plans attached to such planning documents.
>
> * * * *
>
> To the greatest extent possible evaluations are to be conducted by independent staff(s) under the responsible program manager.
>
> NHTSA studies, reports and other technical papers which include evaluation results must be coordinated with the Associate Administrator for Planning and Evaluation.

The Order also details responsibilities and procedures for conducting evaluation efforts within the NHTSA. An attachment to the Order lists the following elements which are to be included in NHTSA planning documents:

1. Statement of Objectives and Evaluation Approach
   - Overview of program or project inputs and end products and their expected impact (in terms of appropriate criterion data).
   - Overview of evaluation approach to be used.
2. Background
   - Discuss findings in earlier evaluations, projects, demonstrations which indicate the need for this evaluation.
3. Evaluation Design
   - Overview of project plan and experimental design.
   - What measures will intermediate outputs and end projects be expressed in?
   - Proposed data sources and initial listing of data categories.

15/ DOT Order 2050.4 dated February 2, 1976.
16/ NHTSA Order 500-1 dated October 22, 1974.

4. Scheduling

- Major milestones
- Detailed time schedule showing project milestones and interim and final report due dates.

5. Reporting Results

- What specific decision(s) affecting what programs, rules, standards, etc., depend on the evaluation?
- When will such decisions have to be made and by whom?

6. Resource Requirements

- Funding
- Man-years

Other Orders Affecting the NHTSA Procedures

Executive Order 12044 and Department of Transportation Regulatory Policies and Procedures

The NHTSA rulemaking process has been substantially affected by Executive Order (E.O.) 12044, "Improving Government Regulations." E.O. 12044 was issued by President Carter on March 23, 1978, and stated the following policy:

> Regulations shall be as simple and clear as possible. They shall achieve legislative goals effectively and efficiently. They shall not impose unnecessary burdens on the economy, on individuals, on public or private organizations, or on State and local governments.
>
> To achieve these objectives, regulations shall be developed through a process which ensures that:
>
> (a) the need for and purposes of the regulation are clearly established;
> (b) heads of agencies, and policy officials exercise effective oversight;
> (c) opportunity exists for early participation and comment by other Federal agencies, State and local governments, businesses, organizations and individual members of the public;
> (d) meaningful alternatives are considered and analyzed before the regulation is issued; and
> (e) compliance costs, paper work and other burdens on the public are minimized.

In anticipation of the Executive Order, the DOT had set forth "Policies and Procedures for Simplification, Analysis, and Review of Regulations" on January 31,

1978. The ploicy statement was issued as an internal memorandum to give DOT employees time to become familiar with the procedures and thus more easily adapt to the expected Executive Order. The DOT policy was formally issued and made effective on March 1, 1978.

E.O. 12044 requires that all agencies publish in the Federal Register a description of how they will implement its provisions. DOT published a modified version of the March 1 policy statement on June 1, 1978, and requested public comment. Based on the comments received, the DOT issued the "Department of Transportation Regulatory Policies and Procedures" on February 15, 1979, effective March 1, 1979. The Order

> establishes objectives to be pursued in reviewing existing regulations and in issuing new regulations; prescribes procedures and assigns responsibilities to meet those objectives; and establishes a Department Regulations Council to assist and advise the Secretary in achieving those objectives and improving the quality of regulations and the policies and practices which affect the formulation of regulations.

The Order sets forth in great detail the guidelines under which regulations are to be implemented by the various agencies of the DOT. Regulations are divided into three categories: significant, emergency, and nonsignificant. "Significant regulations" are defined as those that the heads of the DOT agencies determine:

- o Require a Regulatory Analysis (defined later) or are otherwise costly;
- o Concern matters of public interest or controversy;
- o Have a major impact on other agencies, Federal, State, or local;
- o Have substantial impact on a "major transportation safety problem;"
- o Initiate a "substantial regulatory program or change in policy;"
- o Are substantially different fromt international standards; or
- o Otherwise involve "important Department policy."

The other factors to be considered in determining whether a regulation is significant are:

(1) The type and number of individuals, businesses, organizations, and State and local governments affected;
(2) The compliance and reporting requirements likely to be involved;
(3) Direct and indirect effects of the regulation including the effect on competition; and
(4) The relationship of the regulations to those of other programs and agencies.

An "emergency regulation" is defined as one requiring implementation less than 30 days after publication, not allowing time to collect public comment. "Nonsignificant regulations" are defined as all other regulations.

The DOT Order requires that a draft Regulatory Analysis be prepared and placed in the public docket for "significant" regulations. The Order defines significant regulations as those which:

(1) Will result in an annual effect on the economy of $100 million or more;
(2) Will result in a major effect on the general economy in terms of costs, consumer prices, or production;
(3) Will result in a major increase in costs or prices for individual industries, levels of government, or geographic regions;
(4) Will have a substantial impact on the United States balance of trade; or
(5) The Secretary or head of the initiating office determines deserves such analysis.

The DOT Order specifies criteria for the Regulatory Analysis. Each Regulatory Analysis will contain:

(1) A succinct statement of the problem and the issues that make the regulation significant;
(2) A description of the major alternative ways of dealing with the problem that were considered by the initiating office;
(3) An analysis of the economic and any other relevant consequences of each of these alternatives; and
(4) A detailed explanation of the reasons for choosing one alternative over the others.

Concerning the content of the Regulatory Analysis, the DOT Order contains specific instructions:

> A draft Regulatory Analysis addresses all salient points to the maximum extent possible. If data are lacking or there are questions about how to determine or analyze points of interest, the problem is noted in the draft Regulatory Analysis; to help elicit the necessary information during the public comment period on the advance notice or notice of proposed rulemaking, the appropriate questions are included in the advance notice or notice of proposed rulemaking.
>
> The initiating office includes in each advance notice or notice of proposed rulemaking on a proposal requiring a Regulatory Analysis, an explanation of the regulatory approach being considered or proposed, a short description of the alternative approaches, and a statement of how the public may obtain a copy of the draft Regulatory Analysis for review and comment.

For those regulations which the head of the initiating office determines do not require a Regulatory Analysis, an Evaluation is prepared. The Evaluation includes an analysis of "the economic consequences of the proposed regulation, quantifying, to the extent practicable, its estimated costs . . . as well as its anticipated benefits and impacts."

The Order states that it is the policy of the DOT that the following objectives will be pursued by the agencies when issuing regulations:

(1) Necessity. "A regulation should not be issued or continue in effect unless it is based on a well-defined need to address a specific problem."

(2) Clarity. Regulations must be clear and understandable to those affected by them.

(3) Simplicity. Regulations must be short and uncomplicated. They must be coordinated with other agencies to avoid conflict or duplication. They should be issued "only after compliance costs, paper work and other burdens to the public are minimized."

(4) Timeliness. Regulations should respond to circumstances and be modified or canceled when those circumstances change.

(5) Reasonableness. Regulations should be feasible, be developed along with alternatives, and not impose unnecessary burdens.

(6) Fairness. A regulation should be issued only after ample opportunity for public comment.

The Order establishes a Department Regulations Council composed of DOT Assistant Secretaries and having as ex officio members the heads of the operating agencies. The Council is charged with reviewing significant regulatory proposals and making recommendations to the Secretary.

The heads of offices issuing regulations are charged with a number of responsibilities by the Order. Among other things, the heads of the offices are to:

(1) Review proposed regulations to ensure that they meet the objectives of the Order;
(2) Establish and carry out a program to review and revise existing regulations;
(3) Include in the docket for any NPRM either a draft Regulatory Analysis or Evaluation;
(4) Include in the docket for each final rule a final Regulatory Analysis or Evaluation; and
(5) Submit, for the Secretary's concurrence, the documentation pertaining to significant regulations.

Before submitting a final rule for Secretarial concurrence, the head of the initiating office is required to review all of the documentation for the regulation. That review is to determine that, at a minimum:

(1) The regulation is needed;
(2) The direct and indirect effects of the regulation have been adequately considered;
(3) Alternative approaches have been considered and the least burdensome of the acceptable alternatives has been chosen;
(4) Public comments have been considered and an adequate response has been prepared;
(5) The regulation is written in plain English and is understandable to those who must comply with it;

(6) An estimate has been made of the new reporting burdens or recordkeeping requirements necessary for compliance with the regulation;
(7) The name, address and telephone numbers of a knowledgeable agency official is included in the publication; and
(8) A plan for evaluating the regulation after its issuance has been developed.

For those regulations which would otherwise be considered significant, but are treated as emergency regulations, a statement is included with the regulation explaining why the regulation is being handled as an emergency regulation and listing the name of the official responsible for that determination. Proposed and final regulations that are not considered significant are published with a statement to that effect.

The DOT Order also calls for the periodic review of existing regulations. Guidelines are provided for identifying regulations which need review or possible revocation:

(1) The nature and extent of complaints or suggestions (including petitions for rulemaking) received, especially ones received from those directly or indirectly affected by the regulations;
(2) The need to simplify or clarify language; consideration should especially be given to the number of requests received for interpretations or the problems evidenced in the enforcement of the regulation;
(3) The need to eliminate overlapping and duplicative regulations;
(4) The need to eliminate conflicts and inconsistencies in its own regulations or those of other initiating offices or other agencies;
(5) The length of time since the regulations were last reviewed or evaluated.
(6) The importance and continued relevance of the problem the regulations were originally intended to solve;
(7) The burdens imposed on those directly or indirectly affected by the regulations;
(8) The degree to which technology, economic conditions or other factors have changed in the area affected by the regulations; and
(9) The number of requests received for exemption from a regulation and the number granted.

Each initiating office is required to compile a list of regulations selected for review. That list is submitted to the Department Regulations Council which coordinates these lists for publication in the Federal Register as part of the Department's semiannual Regulations Agenda.

The DOT Order lists seven ways to increase the opportunity for public participation in rulemaking. These include:

(1) Preparation of articles for publications normally read by those affected by the regulations;
(2) The use of advance notices and public meetings for complicated regulations;

(3) The use of surveys or panels;
(4) The opportunity to submit rebuttals to comments in the docket;
(5) Offering financial assistance for the submission of comments;
(6) The inclusion of a statement of what research supports the particular approach chosen, to what extent it supports it, and the fact that it is available in the docket; and
(7) Providing information and instructions in the use of regulatory policy and procedure.

In addition, the DOT Order specifies that the public be given 60 days to submit comments on proposed significant regulations, and 45 days for nonsignificant regulations. When those time schedules cannot be met, or would not be in the public interest, a statement to that effect should be published with the proposal or final rule. Procedures are also specified for coordination with State and local governments.

Also, the DOT Order requires each initiating office to prepare a semiannual Regulations Report summarizing each proposal and final rule being considered during the next 12 months. This report is updated every 2 months. Finally, the DOT Order does not apply to rulemaking in which an NPRM had been issued or was still in progress as of March 1, 1979, the effective date of the Order.

Five Year Rulemaking Plan

On March 16, 1978, the NHTSA published a "Five Year Plan for Motor Vehicle Safety and Fuel Economy Rulemaking." That plan was subsequently updated and published on April 20, 1979. The document was initially developed in 1977 and 1978 during a series of intensive meetings among, primarily, the offices of Rulemaking, Research and Development, Plans and Programs, and the Chief Counsel. The object of the effort was to establish a set of rulemaking priorities to which the NHTSA would direct its resources. An initial set of over 100 projects was evaluated using criteria as number of deaths and injuries associated with a safety problem, lifesaving potential of a proposed safety standard, research and engineering data on the problem, and anticipated costs to consumers and industry. The results of the assessment were the approximately 40 rulemaking activities described in the Five Year Plan.

The objectives of the Five Year Plan are stated as follows:

> First, to provide policy guidelines for use within NHTSA for the development and issuance of motor vehicle safety and fuel economy standards.
>
> Second, to provide the public with information on proposed future activities and priorities, and permit the industry to anticipate potential requirements in its long-range planning.

The plan is designed as a dynamic document, with changes and revisions expected in response to "technological innovations, new crash injury findings, persistent

safety hazards, changes ir agency resource availability, formal agency evaluations, or other pertinent information." The NHTSA states that the plan can be used as a guide for its intended actions and as a basis for judging its performance.

The plan is a statement of the NHTSA's plans for full utilization of its rulemaking resources. The NHTSA stated that the plan was ambitious but that with "efficient and effective management" the program could be successfully implemented. Implicit in this statement was the recognition that additional rulemaking initiatives would require either additional resources or deferment of some elements of the plan.

Public comments on the 1978 Five Year Plan praised the NHTSA for its efforts at long-term programming. Several automobile manufacturers encouraged further planning as well as increased government-industry dialogue. More specific comments requested that the NHTSA quantify the benefits and effectiveness ratings of the above factors. The NHTSA responded.

> The level of detail sought . . . on a rule-by-rule basis will not be found in this document. In fact, the rulemaking priorities underlying this plan were established based on available death and injury data and on the considered judgment and analysis by NHTSA's high level technical staff and senior management. NHTSA is currently expanding its accident data gathering activities to assemble the data needed to support some of the proposed rulemaking in this plan. Quantitative analysis of the benefits and costs of prospective rules will be performed and subjected to public view as an intrinsic part of specific rulemaking proceedings.

The NHTSA also responded to concerns that by publishing the Five Year Plan it was putting manufacturers "on notice" to begin development in specific safety areas. The NHTSA stated that voluntary industry efforts in advance of specific standards would be appropriate but that commitments were not expected at this stage.

The plan classifies rulemaking into three categories: near-term rulemaking, technical amendments, and exploratory research and rulemaking. Near-term rulemaking is defined as action "where it is clear that rulemaking is a reasonable way to solve fairly well-defined problems." Technical amendments are primarily clarifications of existing standards. Exploratory research and rulemaking "covers those categories of activities where a safety problem has been determined but additional research and engineering analyses are necessary to explore feasible solutions."

In addition, the plan specifies five areas of highest priority for safety standards rulemaking: occupant crash protection, light truck and van safety, pedestrian safety, vehicle braking, and motorcycle safety. Regarding occupant crash protection, the plan outlines both near-term and exploratory rulemaking. Near-term actions include extension of the automatic restraint rule to light trucks and vans and improved side-impact protection. Exploratory rulemaking includes the development of a systems approach toward crash protection, integration and upgrading the protection required in the various crash modes, and dealing with the aggressiveness of vehicles when colliding with other vehicles.

For light trucks and vans, the NHTSA plans near-term rulemaking to extend the applicability of many of the present standards to these vehicles. Near-term rulemaking listed for pedestrian safety includes a planned rule to "modify vehicle front-end bumpers and hood edges to lessen pedestrian injuries. . . ." In the near-term and in the exploratory categories, the NHTSA plans additional research and nonrulemaking activities (such as education programs) to reduce pedestrian injuries.

For vehicle braking, the NHTSA states that substantial improvements have already been made but that additional improvements are possible. The NHTSA plan calls for near-term actions such as the inspection and diagnosis of degraded braking and the reliability and performance of nonfactory-installed brakes. Exploratory approaches listed included research into automatically adjusting devices, antilock brakes, and long-life brake systems.

Finally, the NHTSA expresses concern over recent increases in the accident rate for motorcycles and the plan lists near-term rulemaking for motorcycle helmets. Crash avoidance is for longer term program emphasis in motorcycle safety.

Also contained in the April 1979 plan are: projects listed in the March 1978 plan which are being terminated and those areas in which no rulemaking is anticipated; a rulemaking schedule showing anticipated dates and "rough estimate(s) of the anticipated effective dates;" and cross-reference indices covering changes since the previous plan, proposed safety rulemaking by vehicle type, and rulemaking by proposed effective date.

Additional documents complement and support the Five Year Plan. These are an Appendix (which was published with the Plan) and an internal paper, "Research and Development Plans in Support of the Safety Rulemaking Plan." The Appendix describes in more detail individual motor vehicle safety rulemaking actions and contains "a discussion of the safety problem that a regulation is designed to ameliorate, the approach to be used in developing and issuing the rule, and some of the major issues to be resolved in the development of the final rule." The Appendix, like the Five Year Plan, is organized in three sections: near-term rulemaking, technical amendments, and exploratory research and rulemaking.

The "Research and Development Plans" were coordinated between the Offices of Research and Development and Rulemaking in April 1979 and published internally in July 1979. The foreword to this document contains the following description:

> This document contains the detailed [Plans] developed by Research and Development and Rulemaking to support the approved NHTSA Rulemaking Plan. It also contains the methodology and plan for the accomplishment of Cost, Weight, and Lead-Time Analysis developed by Research and Development in support of the [Rulemaking Plan]. Finally, it contains the initial efforts by the National Center for Statistics and Analysis to define the accident data requirements in support of the individual . . . tasks and schedule description.

The Research and Development Plans are currently being revised by the NHTSA in the sense that the entire Rulemaking Plan is a dynamic document. In particular, the NHTSA is in the process of refining a plan for the data collection needs of the agency in support of safety rulemaking.

PART II

Examples of Current Rulemaking

Introduction

Part I of this Case History describes the formal rulemaking procedures established by NHTSA or DOT order. The purpose of Part II of the report is to illustrate the rulemaking process by describing examples of rulemaking activity in which the NHTSA is presently engaged.

It is noted that the prescribed process and the actual process of rulemaking are not always identical. NHTSA officials interviewed by the Safety Board were candid in acknowledging that Order 800-1 is not followed to the letter, but said they believed that the spirit of the Order was followed.

There are several reasons for the discrepancy between prescribed and actual procedures. NHTSA officials explained that adhering to all the steps specified by Order 800-1 simply required too much time and paperwork. In addition, the Five Year Plan has effectively eliminated the procedures formerly specified for initiating rulemaking, in particular those surrounding the development of the Project Plan Description (see page 11). Finally, NHTSA officials revealed that much of the early rulemaking process is conducted informally in meetings or in telephone conversations prior to formal written comment at required stages of rulemaking. While the Safety Board will concentrate its review on documentary evidence, interviews with the NHTSA personnel indicated that informal contact and activity between the various offices involved in rulemaking is constant and vigorous, and constitutes an important factor in the development of safety regulations.

Eight standards have been selected as examples of current rulemaking:

(1) FMVSS 108, Lamps, Reflective Devices, and Associated Equipment
(2) FMVSS 130, Heavy Duty Vehicle Brake Systems
(3) Low Tire Pressure Warning Indicators
(4) FMVSS 203/204, Impact Protection for the Driver from the Steering Control System and Steering Control Rearward Displacement
(5) FMVSS 214, Side Door Strength (Side Impact Protection)
(6) Pedestrian Initial Impact Protection
(7) FMVSS 302, Flammability of Interior Materials (School Buses)
(8) 400 Series, System Safety Standards (occupant crash protection)

These eight rules were chosen to illustrate the rulemaking process of the NHTSA. Individual rules are characterized by varying data needs, particular problems, and different levels of importance, and the examples chosen are intended to present a broad spectrum of rulemaking activity. The cases represent both different types of standards, as well as regulations in different stages of development. Included are examples of maintenance, upgrading, and extension of existing standards, and new rulemaking initiatives. The examples were discussed with NHTSA officials who cooperated by providing access to background materials which documented the process by which each of the eight examples has been, or is being, developed.

This section of the report does not analyze the technical feasibility of particular standards. The purpose of this discussion is to illustrate rulemaking procedures by describing how particular rules are upgraded, extended, or initiated. The evaluation of these procedures will be contained in the fourth and final volume of this study of the NHTSA's rulemaking process.

MVSS 108, Lamps, Reflective Devices, and Associated Equipment

A description of FMVSS 108 is included in this report to illustrate the maintenance aspect of rulemaking. In addition, both near-term and exploratory rulemaking have been initiated on this crash avoidance standard, the former resulting directly from preliminary research.

The purpose and scope of FMVSS 108 are stated as including the specification of original and replacement equipment necessary for signaling and for the safe operation of vehicles during hours of darkness. The standard is applicable to most motor vehicle lighting equipment. The standard specifies the number, placement, size, and power of lights required for various vehicles. The standard also refers to the Standards and Recommended Practices of the Society of Automotive Engineers (SAE) for more detailed specifications of equipment.

FMVSS 108 was first proposed as an NPRM on December 3, 1966, and issued as a final rule on February 3, 1967. Since that time the standard has been amended at least 37 times and has been the subject of 122 notices in the Federal Register. The complexity of these amendments and notices has varied from minor typographical corrections to complete restructuring of the standard. During the interviews with the staff of the NHTSA, officials estimated that FMVSS 108 has been petitioned more than any other safety regulation. From 1966 until 1976, the NHTSA had three staff professionals assigned full-time to maintaining FMVSS 108, and it was estimated that, on the average, the agency has received a petition on FMVSS 108 every month for 10 years.

The level of detailed specification in the standard has necessitated constant monitoring as the industry has introduced new products. The NHTSA staff stated that the format of FMVSS 108 is dictated in part by the users of the standard. For example, State enforcement agencies prefer definite specifications to facilitate checking vehicles for compliance. The NHTSA staff stated that it is more practicable to check for a specified number of lights in specified locations on a vehicle than to verify a "pure" performance standard. The staff believed that it

could write a "pure" performance standard, but that such a standard would not best serve the requirements of the users of FMVSS 108.

A significant amount of work related to FMVSS 108 involves analysis of and response to petitions. This has been the case ever since the rule was issued in 1967. While the types of petitions received vary from minor to major, each requires certain staff actions.

Once the petition has been received, the NHTSA staff prepares a preliminary analysis of the issues involved. This analysis and a recommended action (denial, granting, or referral) is distributed internally within the NHTSA for comment. If a public docket has been established on the issue, an analysis of the comments received is also prepared. If the recommended course of action is to grant the petition, an estimate of the impact of the petition is made. In some cases this may require the preparation of a Rulemaking Support Paper as well as a Regulatory Analysis. The amount of preparation required by the NHTSA on petitions varies on a case-by-case basis. Two recent FMVSS 108 petitions on which the NHTSA has closed action will illustrate this process.

In 1977, the Ford Motor Company petitioned the NHTSA that the rear lights of its model years 1972 through 1974 Capri's were involved in apparent inconsequential noncompliance. The lights used on those model Capri's did not meet the definition of "red" as specified in FMVSS 108 with the result that the rear lights were "more pink than red." Ford petitioned that it was unlikely that any drivers would mistake the "pink" rear lights with the amber turn signals and that the impact of the "pink" lights would therefore be minimal. A docket requesting comments was established, and manufacturers such as General Motors and International Harvester replied in favor of the Ford petition. A synopsis of the comments received was prepared by the NHTSA staff and attached to a preliminary analysis of the petition. The NHTSA Rulemaking staff recommended granting the petition and an approval package was routed within the NHTSA for concurrence. The petition was resolved in favor of Ford's request and a Rulemaking Support Paper was prepared. The petition was granted in May 1977.

Also in 1977, the Budd Company petitioned the NHTSA for relief from the standard due to inconsequential noncompliance. Budd had produced 80 vans on which the clearance and identification lights were placed on the rear of the vans lower than was allowed by FMVSS 108. Budd argued that the lights still presented a clear image of the vans and that in some cases lights are required to be placed lower because of the nature of the vehicle. The NHTSA Rulemaking staff disagreed and pointed out that the standard required a placement as close to the top as practicable. The NHTSA denied the Budd petition stating that the standard was clear on this point and that drivers had come to expect a certain display of lights and any deviations from that would be confusing and detrimental to highway safety. There was no internal disagreement within the NHTSA on this issue. A Rulemaking Support Paper was not prepared.

The Five Year Rulemaking Plan calls for a series of actions concerning FMVSS 108. First, certain actions listed in the 1978 Plan are terminated, such as "Lamps, Reflection Devices and Associated Equipment (Docket 74-5)." That

docket dealt with a January 1974 NPRM to establish requirements for optional acceleration and deceleration lamps. In April 1976, an NHTSA memorandum in the docket indicated that further rulemaking was being suspended because of public comments, inconclusive research, and other petitions.

The section of the Five Year Plan for near-term rulemaking describes the NHTSA plans for "Rear Lighting and Signaling." The NHTSA references a research project that shows a 50-percent reduction in rear-end accidents for a fleet of taxicabs equipped with a separate, high-mounted brake light. The rulemaking approach described is to upgrade FMVSS 108 to reflect these findings. 17/ The NHTSA discusses the possibility of other requirements such as adding lights to the current systems and including deceleration rate information in the stop light display. The rulemaking is scheduled as follows: ANPRM--1979; NPRM--1980; Rule--1981; and effective with model year 1983 vehicles.

The Research and Development Plan in support of the near-term rulemaking on FMVSS 108 describes an in-house data analysis of rear-end accidents. The Plan calls for a review of all existing accident data files to identify relevant accidents. The individual reports will be reviewed to determine which accidents are attributable to poor rear lighting. This group of accidents will then be extrapolated to nationwide predictions on the scope of the problem.

In support of rulemaking for "Rear Lighting and Signaling," the NHTSA has sponsored one completed research effort and has another effort underway to evaluate rear lighting systems. The first effort was conducted by the Essex Corporation 18/ and was a field test using approximately 2,100 taxicabs in the Washington, D.C. area. Four groups of taxicabs were tested over a 12-month period. The four systems tested were:

(1) A single, centered, high-mounted stop light;
(2) Two high-mounted stop and turn lights;
(3) Presence lamps separated from the stop and turn signal lamps; and
(4) A standard configuration for a control group.

The study concluded that the group with a single, centered, high-mounted light were involved in less than half the number of rear-end collisions than the control group. In addition, the repair costs for the accidents of this group were significantly lower than any of the other groups. The other two systems tested had accident rates which were comparable to that of the control group.

The NHTSA has sponsored a second research effort with the Allen Corporation of America 19/ to validate the results of the first effort on a national

17/ Following a multiple-vehicle accident at Corona, California, in 1975, the Safety Board recommended to the NHTSA a revision of FMVSS 108 similar to the rulemaking planned. See NTSB Recommendation H-75-35, December 2, 1975.
18/ "Field Test Evaluation of Rear Lighting Systems," Essex Corporation, Final Report, February 1973 (Contract Number DOT-HS-5-01228).
19/ "Validation of the Rear Lighting and Signaling System Field Test" (Contract Number DOT-HS-7-01756).

basis. This project involves collecting accident data from seven fleets of vehicles. The cars are equipped with the single, centered, high-mounted stop light and are being compared with control groups in each fleet. The progress reports for this contract show tentative results which validate the findings of the initial high-mounted stop light project. The fleets were monitored throughout calendar year 1979 and final statistical estimates of effectiveness will not be available until after the data are analyzed.

The NHTSA rulemaking staff has prepared a preliminary draft of a Rulemaking Support Paper supporting the issuance of an ANPRM. The ANPRM would solicit information on three issues:

(1) The need, design, and costs of a separate high-mounted brake light on passenger cars;
(2) The possible combination of the above brake light and a deceleration signal; and
(3) The changing of FMVSS 108 to require amber-colored turn signals in lieu of allowing amber or red lights.

The Support Paper lists the background problems, the research results, and the potential benefits and impact of such actions. However, in view of the results of the initial high-mounted stop light research, the NHTSA has recently decided to issue an NPRM for the high-mounted brake lights and to contract for more cost estimates for that system. The Support Paper has not been circulated for comment outside of the Rulemaking Office.

The NHTSA has also planned exploratory research and rulemaking listing three projects for improved vehicle lighting. The first concerns motorcycles and mopeds, and entails making the vehicles more conspicuous during daytime and standardizing the physical and photometric requirements of head lamps for these vehicles. The second area is heavy trucks and buses, and involves a review of current lighting systems for these vehicles and the definition of a set of performance requirements (excluding headlights). The third area is headlights for all motor vehicles and concerns improvements of the effectiveness of low-beam lights. Factors such as total candlepower, light distribution, and aiming are to be part of the planned research effort.

FMVSS 130, Heavy Duty Vehicle Brake Systems

Rulemaking in Heavy Duty Vehicle Brake Systems exemplifies exploratory rulemaking associated with a crash avoidance standard. The subject of truck braking systems has been a controversial one with new rulemaking growing out of an existing rule, FMVSS 121.

FMVSS 130 was first proposed in an ANPRM issued on February 12, 1979. The notice solicited "the views of all interested persons on steps to be taken regarding a new Air Brake Standard No. 130 for trucks, buses, and trailers to replace Air Brake Standard No. 121 in its present form." The NHTSA decided to issue a new standard as a result of the ruling of the U.S. Court of Appeals for the Ninth Circuit. The Court's decision in PACCAR v. NHTSA and DOT (573 F. 2d 632

(9th Cir. 1978), cert. denied, October 2, 1978) invalidated certain aspects of FMVSS 121. 20/ The ANPRM requested information from the public on suspected defects in past FMVSS 121 designs which might require recalls; recommendations for changes to the remaining requirements of FMVSS 121; information on models for which manufacturers plan to offer antilock devices as standard equipment; views on consolidation of gains in truck and trailer braking over the past 3 years; data on the stopping capability of vehicles from 60 mph; and views on whether any new requirements should apply to school buses. The NHTSA stated that a second ANPRM would be issued to cover "longer-range issues of braking technology such as automatic brake adjusters, and other means to improve vehicle stability, including antilock systems."

The appendix to the 1979 Five Year Plan listed two projects related to the new FMVSS 130. The first project was a description of the proposed rulemaking action and noted the ANPRM soliciting information on current state-of-the-art brake systems. It was indicated that an NPRM was scheduled for 1979, while the date of a final rule and an effective date remained to be determined.

The second project was listed under the section for Exploratory Research and Rulemaking. The description referred to an improvement in braking performance with automatic adjusting devices. The project description referred to the need for these devices as shown by a study of the California Highway Patrol and as recommended by the National Transportation Safety Board. 21/ The project called for the issuance of an ANPRM in 1979 to request comments on the feasibility of requirements for automatic brake adjusters.

The Research and Development Plan for FMVSS 130: Heavy Duty Vehicle Brake Systems was approved on May 14, 1979. That plan differed from the February 12, 1979, ANPRM in that it covered heavy duty vehicle brake systems as opposed to air brake systems only. The plan specified an extensive field test program to answer questions on two levels: near-term capabilities of braking systems and longer term improvements in such areas as lateral stability and brake maintenance.

The plan called for a multitask project including,

(1) A field program to establish stopping distance data for heavy duty trucks;
(2) An inservice demonstration of antilock device-equipped transit buses; and
(3) A pilot feasibility study of various alternatives in support of the above evaluation.

20/ For further details on FMVSS 121 see, "Safety Effectiveness Evaluation of the National Highway Traffic Safety Administration's Rulemaking Process, Vol. 1--Case History of Federal Motor Vehicle Safety Standard 121: Air Brake Systems" (NTSB-SEE-79-4).
21/ NTSB Recommendation H-78-14, June 23, 1978.

The plan called for the tasks to be performed over a 6-year period ending in fiscal year 1984.

On October 10, 1979, the NHTSA issued an NPRM proposing "the early implementation of a portion of a new safety standard on heavy duty vehicle brakes." The proposed standard would require vehicles over 10,000 pounds to have service brakes that act on all wheels. The NHTSA stated that the new FMVSS 130, when fully implemented, would regulate brake systems on heavy duty vehicles instead of only air brake systems. A submission to the public docket by the Insurance Institute for Highway Safety was referred to as the major factor in the NHTSA's decision to make FMVSS 130 applicable to all heavy duty vehicles regardless of the means of brake actuation. The NHTSA stated, "As FMVSS 130 is implemented, any redundant requirements in either FMVSS 105-75 [hydraulic brake systems] of FMVSS 121 will be revoked."

The basis for this NPRM was stated as follows:

> Although the agency is not prepared to propose FMVSS 130 in its entirety, new information has led the agency to conclude tentatively that there is an immediate need to establish one portion of Standard No. 130. As a result of the PACCAR decision, the agency suspended the road test requirements for trucks and trailers. This suspension has reportedly caused some manufacturers to contemplate the removal of front axle service brakes from some trucks. This is an extremely dangerous situation that could significantly reduce the safety of the affected vehicles.

The NHTSA stated that the product liability factor had previously been considered sufficient to motivate manufacturers to continue to install front axle brakes. However, the NHTSA believed that "the fear of product liability claims has apparently been out-weighed for some manufacturers by the savings in weight and cost that would result from the removal of front axle brakes." Preliminary data from heavy duty vehicle stopping distance tests were presented in the NPRM showing the increases due to deletion of front brakes. The notice published the outline for the proposed FMVSS 130 with most of the sections reserved for future amendments.

During interviews with the rulemaking staff of the NHTSA, the tentative plans for FMVSS 130 were discussed. An NHTSA official stated that because of the past controversy surrounding FMVSS 121 and antilock devices in particular, he believed that it would be useful to issue the outline of a standard for heavy duty vehicle brake systems. The first step in this process would be to determine what parts of braking systems should be regulated. When a consensus had been reached, the NHTSA would implement the standard on a part-by-part basis. For example, all of the requirements for preventing contamination of the braking fluid would be established at one time. Each subsystem requirement would be introduced as an NPRM with opportunity for public comment on each requirement.

The Safety Board was also informed that the ANPRM for the longer range plans in the area of braking had been delayed. The draft ANPRM was to solicit

comments from the public on eight aspects of heavy duty vehicle braking systems. The Office of the Secretary of Transportation (OST), however, had required a Regulatory Analysis which initially had not been prepared. The NHTSA, therefore, prepared a draft Regulatory Analysis. It discussed the basic problem, listed potential solutions and the expected range of costs, and explained that it was impossible to quantify anticipated benefits at this stage. The NHTSA also listed the ongoing and planned research and the methodology that would be followed in identifying alternative approaches. The draft Regulatory Analysis will be placed in the public docket for comment when the ANPRM is issued.

New Rulemaking Initiative: Low Tire Pressure Warning (LTPW) Indicators

Activity in the area of Low Tire Pressure Warning (LTPW) Indicators illustrates crash avoidance rulemaking which has not yet resulted in a formal notice. In addition, it is a proposal which, from its inception, has been questioned on the basis of whether costs justify benefits.

The concept of a safety standard mandating devices to warn a driver of low tire pressure has been under consideration since 1970. An NHTSA report on the proposed standard described its early history:

> In 1970 the . . . NHTSA included low tire pressure warning devices in the Program Plan for Motor Vehicle Safety published in June 1970. The rulemaking sheet stated that the major problem to be solved was the cost effectiveness of the device and that no progress on the rulemaking action was initiated because other rulemaking had taken priority.
>
> Research to determine the state-of-the-art of low pressure tire warning indicators was initiated. The NHTSA conducted a patent search of over 130 patents that dealt with tire inflation as well as warning devices that could signal underinflation. These devices are capable of: (1) indicating pressure, (2) monitoring the pressure, (3) maintaining tire pressure, (4) automatic control and supervision of pressure, and (5) warning of low inflation pressure.

The NHTSA determined that the cost per vehicle for a system which would produce a signal on the vehicle dashboard was prohibitive. The rulemaking process was stopped pending further developments in the state-of-the-art. Between 1973 and 1977, additional draft ANPRM's were circulated for comment within the NHTSA, but none resulted in a published notice.

More recently, low tire pressure warning has been incorporated into the Five Year Plan as Exploratory Rulemaking. The plan states, "Exploratory tire safety activity will include consideration of . . . means to warn when tire inflation pressure drops below recommended levels, including minimum performance for warning devices, for all vehicles." In addition, a staff report prepared for the House Subcommittee on Consumer Protection and Finance (May 17, 1979) encouraged the NHTSA to pursue rulemaking on LTPW devices.

The Appendix to the Rulemaking Plan contains a more extensive description of the planned activities. The Appendix refers to the problem of low tire pressure as a major factor in tire safety, expected tread life, and fuel economy. The NHTSA states that at highway speeds an underinflated tire can produce temperatures which result in tire failures, tread and casing separations, and fabric fatigue. A study is cited which claims that low tire pressures are causally involved in 1.4 percent of traffic accidents on city streets and rural roads.

Also noted are studies which estimate that tire life is reduced by 15 percent for each 10 percent of underinflation and that reductions in fuel economy of 3 to 8 percent are being experienced by current passenger cars. Recent surveys have also indicated that 3.5 percent of passenger car tires are at least 2.0 pounds per square inch (psi) underinflated.

The Appendix details the research planned by the NHTSA in the area of LTPW indicators. The first task planned is a study of the various devices available and their estimated reliability. Two generic types of devices are defined: "active" systems, where the operator must look at a device mounted on the tire; and "passive" systems, which would alert the driver by means of a light on the vehicle dashboard. Each type of device would be tested by the NHTSA in a fleet demonstration, collecting data on cost, use, maintenance, malfunction, and radio frequency interference potential. These data would be supplemented by data from industry test fleets which are currently testing these devices. The second task is directed toward evaluating the human factors aspects of the effectiveness of LTPW devices.

The Research and Development Plan for LTPW devices contains more detail on the proposed rulemaking. The plan states that underinflation is involved in 392,000 accidents a year at a cost of $345 million. It adds that "each year 653 persons die in accidents caused by low tire inflation pressure. An additional 25,000 persons are disabled." The Plan goes on to estimate the potential costs for countermeasures and lists other studies that are being conducted in this area. The schedule for rulemaking is listed as follows: NPRM--FY 1982; Rule--FY 1983; Effective date--To Be Determined.

A number of internal documents have been prepared by the Rulemaking Office in support of an LTPW device standard, including a Rulemaking Support Paper and a cost/benefit analysis.

The cost/benefit analysis reviewed four regulatory options open to the NHTSA:

(1) An all-active system for all cars and trucks;
(2) An all-passive system for all cars and trucks;
(3) A passive system for all cars, multipurpose passenger vehicles, and the front tires of trucks and buses; and
(4) An active system for all cars, multipurpose passenger vehicles, and the front tires of trucks and buses.

The analysis estimated both safety and fuel economy benefits which could result from an LTPW indicator standard. Cost of implementing both active and passive systems were also assessed for each of the options. The report raised

questions about whether the possible benefits of an LTPW standard outweighed its costs.

The draft Rulemaking Support Paper updated and expanded on some of the information contained in the cost/benefit analysis. One of the additional points raised by the Support Paper was product liability concerning active LTPW devices. Many devices had been removed from the market because of insurers' concerns over systems that required opening of the primary seal at the valve stem. The Support Paper indicated that the NHTSA had contracted to have several prototype tire valve LTPW systems produced. The schedule for rulemaking proposed an NPRM in fiscal year 1980 and a final rule in 1982 with the standard becoming effective in 1984. The potential benefits, costs, and other impacts were discussed, as well as potential reactions of interested parties and the interaction of an LTPW standard with other safety standards. A proposed sampling of tire pressures some 5 years after the effective date of the rule was offered as the evaluation plan.

The draft NPRM attached to the Support Paper called for the mandatory use of active LTPW systems by all vehicles. Alternately, a passive system could be used at the manufacturer's option.

The Rulemaking staff also prepared an Executive Summary of the Rulemaking Support Paper. The Summary stated that the schedule for rulemaking had been selected to allow sufficient time for the development of active LTPW devices that do not violate the primary tire seal valve. The reason for this approach was that the active systems were most cost beneficial and the staff believed that they could be implemented immediately.

As of the time of this writing, the Rulemaking Support Paper has not yet been circulated outside the Rulemaking Office for comment.

FMVSS 203 and 204, Impact Protection for the Driver from the Steering Control Column and Steering Control Rearward Displacement

Rulemaking activity associated with FMVSS 303 and 204 was selected for inclusion in this report to demonstrate the process by which an existing rule is extended. An NPRM was published in November 1978, and a final rule followed in November 1979.

The purpose of FMVSS 203 is to reduce the likelihood of death or injury to a driver by requiring an energy-absorbing steering column. The standard describes a test procedure specifying that when the steering assembly is impacted at a speed of 15 mph by a body block resembling a human torso and head, "the impact force developed on the chest of the body block transmitted to the steering control system shall not exceed 2,500 pounds." The regulation, which became effective on January 1, 1968, applies only to passenger cars and to non-forward-control vehicles. 22/ As to the latter, manufacturers are given the option of a Type 2

22/ A forward-control vehicle is one in which more than half of the engine length is rearward of the foremost point of the windshield base and in which the steering wheel hub is in the forward quarter of the vehicle length.

seatbelt assembly (a lap-shoulder belt combination) if they cannot meet the requirements of the standard.

FMVSS 203 was amended, effective May 27, 1975, to exclude from its requirements "vehicles that conform to the frontal barrier crash requirements . . . of Standard No. 208 . . . by means other than seat belt assemblies." The amendment was initiated by a GM petition which argued that incorporation of air cushion restraint systems required modifications to the steering control which made conformity to FMVSS 203 difficult or even impossible. In the explanation to the amendment, the NHTSA stated that while it generally supported redundant protection offered by different standards, "the redundant protection offered by Standard No. 203 is not justified where it directly interferes with development of a more advanced, convenient, and effective restraint system [40 FR 1792]."

The purpose of FMVSS 204 is to reduce the likelihood of chest, neck, and head injury by specifying requirements "limiting the rearward displacement of the steering control into the passenger compartment." The standard prohibits the upper end of the steering column from being displaced horizontally rearward more than 5 inches when the vehicle is subjected to a 30-mph frontal barrier crash. Like FMVSS 203, the standard applies to passenger cars and authorizes a lap-shoulder belt combination as an option for forward control vehicles which cannot meet the requirements of the rule. FMVSS 204 became effective on January 1, 1968.

An NPRM published on October 30, 1970 (35 FR 16805) proposed to extend the requirements of FMVSS 204 to multipurpose passenger vehicles, trucks, and buses of 10,000 pounds or less gross vehicle weight rating (GVWR). It also proposed a vehicle loading requirement for the barrier test, as well as a procedure for determining a point of reference on the vehicle from which the rearward displacement of the steering control could be measured. After reviewing numerous comments responding to the NPRM, the NHTSA announced in May 1973 that it had concluded that the proposals should be revised and that it would issue new notices of proposed rulemaking in the future.

Recent rulemaking activity on FMVSS 203 and 204 has centered around efforts to extend the regulations to trucks, vans, and multipurpose vehicles of less than 10,000 pounds GVWR [hereafter referred to as LTM's]. The need for extension of the Standards was described in the NHTSA's Five Year Plan. The Plan indicated that consideration would also be given to upgrading FMVSS 203 to include angular impact into the steering assembly and upgrading FMVSS 204 to include a vertical displacement requirement. The Research and Development Plan (Level III) supported the proposed rulemaking, estimating data needs, technical support, and staff time necessary to the rulemaking.

An NPRM proposing to extend the applicability of FMVSS 203 and 204 to LTM's was published on November 9, 1978 (43 FR 52264). 23/ The proposal also

23/ The NPRM also proposed the same extension for FMVSS 201 - Occupant Protection in Interior Impact, a standard requiring interior padding for dashboards, sun visors, armrests, and seat backs.

required a Type 2 seatbelt in front outboard positions for LTM's and continued the exemption from standard 203 of all vehicles complying with FMVSS 208 by means of air bags.

The NPRM responded in part to petitions from the Center for Auto Safety and the Insurance Institute for Highway Safety. The NHTSA also cited as justification for rulemaking a marked increase in the number of fatalities and injuries to people riding in LTM's and evidence that fatality rates are higher in these vehicles than in passenger cars. The agency supported the effectiveness of the current standards, arguing that accident experience "continues to show that [these] standards have substantially reduced occupant injuries." Work done by various automobile manufacturers was also noted, and cost and leadtime estimates were made. The agency indicated that it was not proposing an upgrade to the standards in the NPRM, but was actively working on an upgrade and welcomed any relevant comment.

The NHTSA's Plans and Programs office drafted a "Preliminary Evaluation of the Proposed Extension . . ." to accompany the NPRM. The purpose of this paper was to examine "the anticipated impacts" of the rulemaking action, and it therefore discussed in greater detail much of the data and rationale used in the explanation of the NPRM. The "Evaluation" included statistics and tables on the LTM population, its accident characteristics, and comparisons to passenger cars. Safety benefit estimates were discussed, and costs of the proposed extension were anticipated based on several sources. The discussion included estimates of how closely the current LTM population already comes to complying with the proposed extension.

The Plans and Programs "Evaluation" also outlined three alternatives to the proposed rule, all of which were rejected. These included: (1) not extending the standards to LTM's and, instead, letting "passive restraint requirements provide all the protection for these vehicles;" (2) introducing both passive restraints and the FMVSS 303/204 extension at the same time in model year 1984; and (3) exempting forward-control vehicles from Standards 203 and 204. Upgrading the standards was considered, but the NHTSA decided to gather more information on the subject without delaying the currently proposed extension.

The period for comment on the NPRM closed in early 1979. Responses were collected and analyzed, and were summarized in a later NHTSA document. The agency concluded, "Most manufacturers except [Volkswagen] and Jeep agreed with the intent of the Standards but all manufacturers except Chrysler argued that additional lead time is necessary." The Center for Auto Safety supported the extension but recommended an upgrade; the Insurance Institute for Highway Safety also agreed with the extension but recommended that the compliance test for Standard 203 be improved. Specific issues raised by respondents were discussed by the NHTSA, including questions by General Motors, Jeep, and the Motor Vehicle Manufacturers Association on the agency's accident data analysis. Several exemptions were also suggested in docket comments, including exclusions for "walk-in van-type" vehicles and for incomplete vehicles. The NHTSA eventually recommended that the former be granted an exemption. In the case of incomplete vehicles, the agency decided to continue with the proposed extension, but

acknowledged that a problem existed and indicated it would "issue new rulemaking actions on Standard 204 as soon as the final rules on Standards 212 and 219 are finalized."

During the spring of 1979, the NHTSA Rulemaking Office drafted a final Rulemaking Support Paper and circulated it within the agency for comment. Both Plans and Programs and the Office of the Chief Counsel returned substantive remarks to Rulemaking, raising questions about points of logic in the Support Paper. Rulemaking then rewrote the draft Support Paper into an "Explanation of Rulemaking and Final Rulemaking Support Paper." It restated the original proposal for an extension of Standards 203 and 204 to LTM's, requiring in addition a Type 2 seatbelt for front outboard seating positions. However, convertibles and "open-body" type vehicles were to be exempt from the seatbelt requirement, while "walk-in van-type" vehicles were to be exempt entirely from the standards. The rewritten Support Paper summarized arguments for the extension of FMVSS 203 and 204, and was modified because of the remarks made by the Office of the Chief Counsel and by Plans and Programs, as well as by docket responses to the NPRM. The "Explanation of Rulemaking and Final Rulemaking Support Paper" was then forwarded to the Office of the Chief Counsel for preparation of a legal draft of a final rule.

Subsequent to the completion of a final Rulemaking Support Paper, Plans and Programs circulated a draft of a "Final Regulatory Evaluation . . . " to Rulemaking and the Chief Counsel. It appears that no formal, written comments were made on the draft, though NHTSA's National Center for Statistical Analysis provided some additional data. In November 1979, Plans and Programs forwarded the final Regulatory Evaluation to the Chief Counsel for inclusion in the docket.

The final Evaluation differed in several respects from the preliminary paper of 1 year before, though the basic arguments remained the same. For example, statistical tables were modified to reflect up-to-date input from the National Crash Severity Study, and safety benefit estimates were modified accordingly. More cost data were available, including a study by the John Z. DeLorean Corporation, as well as docket comment. One significant modification was made, however, between the final Support Paper (August 1979) and the final Evaluation (November 1979). Because of rulemaking activity on Standards 212 and 219 concerning incomplete vehicles, the NHTSA decided to make Standard 204 "effective only to those vehicles with unloaded test weight up to 4,000 lbs." The agency stated that it "intends to issue a notice regarding test requirements for FMVSS 204 for vehicles over 4,000 lbs. unloaded test weight at a later date."

A final rule was issued on November 29, 1979. The rule amends FMVSS 203 and 204 to extend their applicability to LTM's. However, it was decided to limit the extension of Standard 204 to LTM's with an unloaded vehicle weight of 4,000 pounds or less. The extension of FMVSS 203 does not apply to vehicles meeting the frontal barrier crash requirements of Standard 208 by means other than seatbelts, nor does it apply to walk-in vans. The rule will become effective on September 1, 1981.

FMVSS 214: Side Door Strength (Side Impact Protection)

FMVSS 214 is an example of near-term rulemaking in crashworthiness. The process by which a recently published ANPRM was developed illustrates NHTSA procedures in problem identification and planning.

FMVSS 214, Side Door Strength, currently specifies performance requirements for the side doors of passenger cars. The purpose of the regulation, first published as a final rule in October 1970, is to "minimize the safety hazard caused by intrusion into the passenger compartment in a side impact accident." The standard specifies three crush tests in which mechanical devices apply pressure to the doors of a stationary vehicle. Under the peak crush test, a force of two times the curb weight of the vehicle or 7,000 pounds, whichever is less, must be applied before the vehicle door is deformed inward more than 18 inches.

The NHTSA recently published an evaluation of Standard 214. The report found that the regulation reduces the likelihood of intrusion and prevents a substantial proportion of the deaths and severe injuries in single-vehicle, side-impact accidents, such as a vehicle skidding sideways into a tree. However, the study found FMVSS 214 significantly less effective in multiple-vehicle crashes.

Rulemaking to amend FMVSS 214 to increase side impact protection has been a high-priority activity since 1977 and is described in the NHTSA's Five Year Plan. The activity, categorized as near-term rulemaking, is aimed at upgrading the performance requirements of the standard and extending their applicability to light trucks, vans, and multipurpose passenger vehicles. The safety problem which the rulemaking seeks to address is that "approximately one third of automobile occupant fatalities and life-threatening injuries occur to occupants of vehicles which are struck in the side." The Five Year Plan describes the program to upgrade and extend the standard as being composed of three tasks: (1) development of a dummy and performance criteria, (2) testing of vehicle modifications, and (3) development of a test procedure, including a moving barrier impactor. The Plan schedules separate NPRM's for dummy specifications and barrier specification in 1980, a rule in 1981, and an effective date in model year 1984 vehicles.

Though planning and developmental work have been continuing since 1977, rulemaking activity on Side Impact Protection began during the summer of 1979. Activity was directed at drafting an ANPRM proposing amendments to FMVSS 214, requesting comment, and giving notice of a public meeting tentatively scheduled for December 1979.

Documentation for the rulemaking was forwarded for comment from Rulemaking to Plans and Programs, Research and Development, Enforcement, and the Office of the Chief Counsel in August 1979. In this case, a single Rulemaking Support Paper was not prepared. Instead, several documents were assembled to support the rulemaking. These included, in addition to a draft of the ANPRM, a Level III Research and Development Plan for the rulemaking, a technical paper, and a list of contract support. It was noted that a considerable amount of research

had already been done and that it was important that the results of this work be made available to the public as soon as possible.

The draft ANPRM summarized the safety problem and proposed rulemaking activity. This was followed by discussion of the major areas of support research which the NHTSA was sponsoring. Compliance test developments were described, for example, and a specific test condition suggested. Other research was summarized, including efforts to develop a suitable anthropomorphic dummy and performance criteria. The NHTSA presented three possible ways of measuring dummy performance and requested comment from the public on which method would best predict occupant injury and would therefore be most useful in the proposed standard. Finally, the draft ANPRM stated that studies to examine cost, weight, and leadtime were being initiated.

The three documents accompanying the draft ANPRM provided more detailed support for the substance of the proposal. The Research and Development Plan detailed 11 projects, many of these subdivided into more specific tasks. Projects covered the major categories of research and development described in the Five Year Plan--performance criteria, vehicle modification, and compliance test procedures. The Research and Development Plan also described additional research to analyze accident data, to study the proposed standard in terms of light trucks and vans, and to evaluate cost, weight, and leadtime. Each project which was listed included an estimate of necessary budget resources. The Plan concluded with a program schedule identifying proposed milestones and completion dates in 1979 and 1980 for each segment of the program.

Supplementing the Research and Development Plan was a list entitled "Project Support." Information on each task described in the Plan was given, including, if applicable, contract number, contractor, the amount of the contract, and the date work had been or wes to be completed. In some cases work had been finished, as in the finalization of the Highway Safety Research Institute dummy. In other cases, contracts were in various stages of preparation.

Completing the initial documentation for the proposed FMVSS 214 upgrade and extension was a technical paper, "Status of the National Highway Traffic Safety Administration's Research and Rulemaking Activities for Upgrading Side Impact Protection." The paper, prepared by two NHTSA engineers, had been presented in Paris at the 7th International Technical Conference on Experimental Safety Vehicles in June 1979. The report presented technical data and analysis concerning compliance test conditions, development of a dynamic test procedure, anthropomorphic test device design, and performance criteria as they related to side-impact protection. The report concluded by inviting comment from the international community.

Comments on the proposed rulemaking by the various NHTSA offices were returned to Rulemaking in September 1979. The Office of the Chief Counsel, Plans and Programs, Research and Development, and Enforcement all responded to the draft ANPRM with questions or comments. Plans and Programs also submitted a draft regulatory analysis. For the most part, it used information from the draft ANPRM package to summarize the argument for upgrading the standard. It noted

that at this stage in the rulemaking detailed cost data on the proposal's economic impact to the consumer were not available. Benefits were also briefly summarized and, finally, the draft paper concluded by mentioning that alternative solutions, in terms of varying levels of side structure and interior design modification, would result from research activities currently in progress. Plans and Programs' comments on the draft ANPRM as well as its regulatory analysis were circulated back to Research and Development and the Chief Counsel, as well as being forwarded to Rulemaking.

Rulemaking rewrote the draft ANPRM, incorporating into it the comments it had received. This final draft was recirculated to the major office heads for review and the Associate Administrators met shortly thereafter to discuss it. After minor changes to the draft were made, it was then forwarded to the Office of the Chief Counsel. A legal draft of the ANPRM was then prepared and on October 31, 1979 was circulated by Rulemaking to Plans and Programs, Research and Development, Enforcement, and the Bureau of Motor Carrier Safety of the FHWA. This draft constituted the "Coordination Package," though it was also referred to as the "final signature package." This version of the proposed ANPRM was again reviewed and returned to Rulemaking with minor comments.

Finally, in early November 1979, Rulemaking forwarded the ANPRM to the Administrator for final approval. It was noted that the date initially proposed for the public meeting, December 1979, was now unrealistic and it was suggested that the meeting be delayed until January 1980. The ANPRM was signed by the NHTSA Administrator on November 30 and published in the Federal Register on December 6, 1979 (44 F.R. 70204).

Pedestrian Initial Impact Protection

Rulemaking in Pedestrian Initial Impact Protection exemplifies both near-term and exploratory rulemaking. Activity on this standard illustrates detailed planning and development prior to issuance of a notice.

In 1967, the NHTSA began rulemaking efforts aimed at reducing pedestrian injuries. An NPRM proposing elimination of decorative ornaments was published in 1967, and another NPRM addressing all exterior protrusions was prepared, though never published, in 1968. The NHTSA began research in pedestrian protection in 1973, sponsoring a program designed "to provide support for rulemaking directed toward geometric and/or structural modification of vehicle front ends as a means of reducing pedestrian injuries." Initial work was conducted by Battelle Columbus Laboratories between 1973 and 1975. These studies, though limited in scope, did "establish techniques for performing pedestrian impact simulations with cadavers and a yard stick for quantifying pedestrian injuries . . . ." Further contract work included vehicle modification and impact testing using anthropomorphic dummies and cadavers. These studies supported the potential benefit of pedestrian impact rulemaking, concluding that: (1) for adult dummies, pelvic and knee acceleration peaks could be reduced 50 to 80 percent through use of soft bumper and hood edge materials; and (2) that for cadavers, soft structures significantly reduced the extent of injury.

Based on this research, the NHTSA incorporated into its first Five Year Plan (March 1978) a schedule for rulemaking in the area of pedestrian protection. The Plan scheduled an NPRM for 1978, a final rule for 1979, and effective dates in model years 1980 and 1981 vehicles. Responses to the rulemaking Plan were collected in the public docket and later summarized by the NHTSA. The agency stated that "most respondents were in general agreement with NHTSA's proposal to do further research into the area of vehicle modifications for improved pedestrian safety." However, automobile manufacturers expressed concern that "not enough emphasis [was] being placed on the accident avoidance aspects of pedestrian protection."

"Pedestrian Initial Impact Protection" is described as a near-term rulemaking in the NHTSA's 1979 Five Year Plan. The purpose of this activity is to reduce the 8,000 pedestrian fatalities and 100,000 pedestrian injuries which occur in the United States each year. The proposed standard would accomplish this by requiring "softened" vehicle front ends that "afford protection to adult pedestrian legs and lower torsos and to child pedestrians." Performance requirements would be established for vehicle frontal structures including "surfaces that are essentially vertical and less than 18" from the forward most point of the vehicle such as bumper, hood edge, grille, and headlight wells." The schedule for proposed rulemaking is as follows: an NPRM in 1979; a rule in 1080; and an effective date for model year 1983 passenger cars, and model year 1984 for light trucks, vans, and multipurpose passenger vehicles.

The NHTSA Research and Development Plan provides a more detailed outline of the tasks necessary to support the proposed rulemaking on pedestrian initial impact protection. The first step listed is to prepare an NPRM "to establish performance requirements for vehicle frontal structures for the protection of pedestrians." The Plan then outlines 11 tasks which constitute Research and Development's support for the standard. Included among the tasks are the following: (1) impact testing using both cadavers and dummies and comparison of the responses of each, (2) checking the ability of vehicles to meet both the proposed pedestrian impact standard and Part 581 Bumper Standard currently in effect, (3) building a compliance test tool accelerator, (4) assessing the costs associated with the "soft nose concept of frontal structures," and (5) compilation of accident data under the Pedestrian Injury Causation Study.

The Research and Development Plan discusses additional issues associated with the proposed rulemaking. It mentions, for example, the issue of alternative approaches, and notes that it is assumed that a vehicle complying with the proposed standard will be able to comply with other regulations affecting the same area of the vehicle. While the Part 581 Bumper Standard is discussed specifically in the Plan, the relationship of the pedestrian impact standard to such other rules as FMVSS 203, 204, and 208 is not discussed.

In addition to the near-term rulemaking described above, the Five Year Plan describes an exploratory rulemaking effort which will study "appropriate modification to hood surfaces and windshield headers to reduce the severity of pedestrian injuries." In particular, this effort will be aimed at reducing pedestrian head and neck injuries, and will be intended to complement the near-term rulemaking.

The proposed exploratory rulemaking in pedestrian protection is also supported by a program in the Research and Development Plan. The intended tasks involve developing a modified Part 572 dummy head, fabrication of modified vehicle hoods, and establishing repeatability and reproducibility of compliance tests. A Rulemaking Support Paper proposing an NPRM on hood impact response characteristics would be written and issued in late 1982 according to the planned schedule.

A draft Rulemaking Support Paper for "Pedestrian Initial Impact Protection" was completed by Rulemaking in March 1979 and forwarded to Plans and Programs and the Office of the Chief Counsel for review. The paper began by describing pedestrian injury data from the NHTSA's Pedestrian Injury Causation Study. The data were summarized for adults and children and were tabulated for accidents occurring at various speeds. The Support Paper summarized effectiveness and benefit estimates for the proposed standard, concluding that it could substantially reduce pedestrian injury. The effectiveness analysis also stated several caveats to the evaluation: the accident data were not necessarily representative of national accident experience, and some estimates were based on small sample sizes.

Feasibility, practicability, and cost of the standard were also examined using as a basis a modified 1978 Pontiac LeMans. The report found the modifications feasible, but questioned their practicality. Estimated cost of the proposed rule to the consumer was summarized in the report and discussed at length in an appendix. However, the analysis only considered initial hardware costs and operational/fuel costs and noted that factors still to be considered included repairability and replacement, energy costs, and industry impacts such as capital requirements. The analysis also acknowledged that it was based on limited data and indicated that more detailed cost data would soon be available through an additional contract.

The Rulemaking Support Paper examined several additional topics. In a brief discussion of the effect of the proposed rule on the vehicle crash environment and on other Federal regulations, the report pointed out that research for the standard included its compatibility with the Part 581 Bumper Standard. However, it noted some problems not investigated:

(1) Low-speed car-to-car collisions of pedestrian-safe vehicles . . .,
(2) High-speed local impacts with roadside objects, and
(3) High-speed occupant crash protection requirements of FMVSS 208.

The Support Paper also outlined foreign research on pedestrian impact protection and summarized docket comments concerning the proposed rulemaking described in the March 1978 Rulemaking Plan. Finally, the report included a draft of the proposed rule itself detailing the performance requirements, pedestrian simulation devices, and test procedures. The draft included additional explanation and justification for various sections of the rule.

Comments from Plans and Programs on the draft Support Paper complimented Rulemaking on the level of detail in the study. In addition to other comments, the office discussed the justification for the standard based on the cost-benefit analysis. The Office of the Chief Counsel also questioned and

commented on specific details of the proposal, including discussion of the compatability of the proposal with other standards.

After reviewing the comments, Rulemaking transmitted a draft NPRM for Pedestrian Initial Impact Protection, an Explanation of Rulemaking, and a revised draft of the Rulemaking Support Paper to both the Chief Counsel and Plans and Programs, requesting preparation of a legal draft and a regulatory analysis. The Support Paper remained essentially the same as the preliminary version. The basic arguments supporting the proposed regulation were repeated and a draft of the standard itself was identical in both papers. However, modifications were made. Accident data were updated, which caused minor changes in benefit estimates. Research and crash testing had also been completed in the interval between the two Support Papers, and the final version reflected these developments. While both Support Papers discussed developmental work on pedestrian protection in a chapter on countermeasures, neither examined alternatives to the proposed "soft front-end" solution to the problem.

The major expansion of the second version of the Support Paper appeared in the analysis of feasibility and cost. A contracted study had evaluated both for four vehicles with high sales volumes, concluding that modifications could be made allowing the vehicles to meet the requirements of the proposed standard as Part 581. Specific cost estimates were also made. The analysis was a preliminary one that considered only initial hardware costs and weights. Finally, the draft final Support Paper briefly discussed the relationship of the proposed standard to other standards.

At the time of this writing, the Office of the Chief Counsel and Plans and Programs are reviewing the revised Rulemaking Support Paper. Memoranda, meetings, and informal telephone conversations between these two offices and Rulemaking will continue until the final documentation, including a legal draft of the proposed standard and a regulatory analysis, are ready for review by the Administrator. If the proposal is signed by the Administrator, either an ANPRM or an NPRM will be issued, likely in early 1980.

FMVSS 302, Flammability of Interior Materials (School Buses)

The rulemaking effort to promulgate a standard regarding interior flammability for school buses illustrates internal NHTSA processes prior to issuance of an ANPRM or NPRM. Rulemaking activity began in early 1979 and it appears that an ANPRM will be issued in early 1980.

In February 1979, the Secretary of Transportation requested the Urban Mass Transportation Administration (UMTA) Administrator to cooperate with the NHTSA Administrator in developing an ANPRM regarding improved flammability standards for the interior materials of school buses. In addition, the Secretary requested the UMTA to provide to the NHTSA data on the UMTA specifications for interior materials in new transit vehicles. Meetings and data exchanges were arranged and by March 1979 the NHTSA announced that it planned to have an internal draft ready for review by both agencies by April 15, 1979, and the ANPRM in final form no later than June 1, 1979.

FMVSS 302, Flammability of Interior Materials was designed to prevent the use of highly flammable materials in vehicle interiors. Originally, effective September 1, 1973, the standard specified burn resistance requirements for materials used in the occupant compartments of motor vehicles. The purpose of this standard was to reduce the deaths and injuries to vehicle occupants by providing evacuation time in case of fires, especially those originating in the interior of a vehicle from sources such as cigarettes.

The purpose of the proposed rulemaking for school buses was to consider important factors other than escape time, such as making the initiation of a fire more difficult and, if initiated, using materials that would cause the fire to remain localized or to extinguish itself. A study of fires that occurred in transit buses constructed with padded surfaces similar to those used in school buses (FMVSS 222) revealed that while the interior materials involved all passed FMVSS 302 requirements, once the fire built up in intensity and became extremely hot, it burned rapidly, resulting in complete loss of the unit.

It was noted that as the purchase cost of transportation units continues to increase, the possible loss of units as a result of an interior fire becomes more serious. The question raised by the proposed action concerned whether school buses should be built utilizing specifications similar to the UMTA guidelines for interior materials to minimize the threat and impact of fire. In the absence of historical guidance or meaningful school bus accident data, consideration of upgrading school bus interiors, with the inevitable increase in cost, was to be presented to the public through an ANPRM. The ANPRM would solicit comments, with particular emphasis on costs versus related benefits.

Following the initial meeting with UMTA officials, the NHTSA's rulemaking office prepared a Rulemaking Support Paper and circulated it to the UMTA for review. The UMTA responded to the paper commenting that its flammability guidelines, referenced in the Rulemaking Support Paper, were not standards nor were they ever promulgated as having any official status. It was therefore recommended that the references be omitted and replaced by a short and more accurate statement concerning the specifications. The UMTA also responded to several other aspects of the proposed rule, discussing the relevance of cited examples and the NHTSA's cost estimates.

Later, in May 1979, NHTSA's Office of Vehicle Safety Compliance reviewed the Support Paper. It discussed and questioned certain background documents as well as the relationship between the proposal and the current FMVSS 302, Flammability of Interior Materials. Several modifications to testing procedures were also suggested. The Office of Chief Counsel also submitted comments on the draft. The legal office pointed out that Rulemaking needed to clarify the safety benefits that would result from the proposal.

Rulemaking reviewed the comments from the UMTA, Enforcement, and the Office of Chief Counsel, and in a response to them generally concurred with the suggestions and recommendations. The office discussed again the purpose of the rulemaking, stating that it was the intent of this action to respond directly to the Secretary's order, avoiding reference to the current FMVSS 302. There was no

objection "in principle" to consider transit buses in this action; however, it had not been mentioned in the Secretary's request. Rulemaking contended that the Support Paper should be a "precise response to the Secretary's request."

Although comments recommending changes in the Rulemaking Support Paper were reviewed by Rulemaking, the study was not amended in accordance with the suggestions. Accordingly, the Office of Chief Counsel, when requested by Rulemaking to prepare an ANPRM, stated that it could not do so on the basis of the information supplied. A modified Support Paper incorporating all of the comments was requested prior to the drafting of the ANPRM. The Office of Chief Counsel also raised other questions. Since the rulemaking action involved vehicle flammability, it expressed doubt, for example, as to how it could proceed without reference or comparison with the NHTSA's own flammability standard 302. It also disagreed with Rulemaking's response to several of Enforcement's recommendations. Finally, the legal office maintained that the UMTA guidelines referenced in the Support Paper should be explained more fully so that informed comment could be obtained.

Rulemaking then prepared a revised and expanded Rulemaking Support Paper to enable the Office of the Chief Counsel to prepare the ANPRM as requested. The office reiterated its position that the thrust of the rulemaking was to respond to the Secretary's directive. It was pointed out that he had not addressed transit buses, nor had he proposed amending FMVSS 302.

In September 1979, Plans and Programs submitted the required Regulatory Evaluation for the proposed school bus flammability standard. It pointed out the difficulty of estimating potential benefits because of limited data on school bus accidents. Concerning cost estimates, Plans and Programs stated that preliminary information indicated a significant increase in the cost of a vehicle would be required to upgrade the seating material.

The documentation supporting the proposed ANPRM was held in Rulemaking during the fall of 1979. In early December, the Rulemaking Support Paper was returned to the Office of the Chief Counsel for preparation of a legal draft of the ANPRM. NHTSA officials indicated that upon completion of the legal draft it would be forwarded to the Office of the Secretary for review. The estimated date of publication for the ANPRM was March 1980.

400 Series Systems Safety Standards

The 400 Series is the NHTSA's most extensive Exploratory Rulemaking effort. It involves detailed, long-term planning and extensive commitment of resources in order to develop a comprehensive occupant protection standard which will integrate various individual rules currently in effect.

The NHTSA estimates that even after full implementation of FMVSS 208, substantial motor vehicle occupant fatalities will still remain. In order to reduce these fatalities and associated injuries, the NHTSA has developed major longer-term objectives "to consolidate and upgrade all occupant protection rules through a systems approach toward improving occupant safety." The concept upon

which the long-term occupant protection upgrade is based is described as a "total systems approach evaluating a vehicle's occupant protection capability by exposing it to a series of crash exposures representative of the real world." The Five Year Plan indicates that many of the existing component standards will be discarded, and the end product will be a set of comprehensive performance standards which will significantly increase the level of occupant protection.

In addition to safety improvements, which are expected to be substantial, benefits in economy and innovation are expected from the 400 Series due to greater design flexibility, as compared to that permitted by current component-oriented performance standards. The 400 Series standards will "build upon the knowledge that was gained in developing the automatic restraint requirement." Because the 400 Series standards will specify requirements for performance as measured by injury levels, the NHTSA will also develop, "as a high priority activity," an advanced test dummy.

The planned 400 Series is considered exploratory rulemaking and is described in detail in the Research and Development Plan. The program is divided into five basic components, each subdivided into a number of specific tasks (see outline on page 46). Although the tasks are listed as separate entities, many are integrated "to the point of being considered as a single unit" which will provide the necessary input for indicated milestones. One such milestone, for example, is the development of preliminary specifications for demonstration vehicles (Task 21).

The "most important activity" of the 400 Series development is the analysis of accident data. The objective of Accident Analysis (AA) is to establish a "supportable relationship between the occupant injury and the vehicle crash severity." To meet this objective, AA will use the National Crash Severity Study, which has identified parameters, as well as future accident studies to provide the capacity to quantitatively correlate occupant injury to crash severity.

Secondly, the crash severity description used in these accident studies needs to be directly relatable to a laboratory test environment, or Crash Environment Simulator (CES). NHTSA data and engineering analysis have indicated that testing concepts other than those presently used to evaluate crashworthiness (such as flat rigid barriers) are necessary to better reproduce what actually occurs in a crash:

> It is not sufficient to simply measure the ability of a vehicle to protect its own occupants. Of equal importance is the assurance that a vehicle is not overly aggressive to other vehicles it may collide with.

The CES Program will develop a laboratory test which will monitor both the crashworthiness of a vehicle and its aggressiveness.

The development of test devices and test procedures for rollover compliance is another function of the CES Program. It is the responsibility of Research and Development to ensure that both the objectives of the the CES Program and the analysis procedure to quantitatively correlate occupant injury to crash severity are fulfilled.

Concommitant to the need for AA is the development of an upgraded test dummy. Two basic efforts to develop a dummy are defined. The first is to collect research which specifies human injury as a function of some parameters on a dummy; the second involves developing and testing the dummies. This development is scheduled to begin in or before July 1980 in order to meet the 400 Series Rulemaking schedule.

The activities of AA and Dummy Development (TD) are basically independent of each other. While accident analysis is charged with the development of a relationship between crash parameters and injury, it is not concerned with how the occupant becomes injured. Dummy development, however, principally investigates occupant injury and is not interested in crash severity.

TD and CES development programs will need to receive "important input information" from the Systems Analysis and Systems Engineering activities. In particular, accurate projections of the accident environment, such as occupant injury distributions and vehicle population characteristics of the late 1980's, will be "essential to the intelligent selection and development of compliance test devices and procedures."

Following the analysis of the data to quantify the problem and the development of tools (TD and CES) to design, develop, measure, and evaluate the performance of countermeasures, the NHTSA will develop an integrated vehicle and optimum specification. This specification will define both occupant crash protection and fuel economy. The final phase of this development involves demonstration and evaluation. The proposed schedule for the 400 Series NPRM is September 1984; the 400 Series rule is expected to be effective by September 1985.

<u>400 Series Research and Development Outline</u>

I. Systems Analysis and Systems Engineering
   - Task 1 and 2: Accident Analysis
   - Task 3: Trend and Technology Analysis
   - Task 4: Materials and Design Analysis
   - Task 5: Predictive Analysis

   Laboratory Test Analysis
   - Task 6: Analyze existing crash and crush data
   - Task 7: Instrument compliance tests
   - Task 9: Conduct and analyze baseline crash and crush test programs

II. Biomechanics and Advanced Dummy Development
   - Task 9: Basic Biomechanics Research
   - Task 10: Development of Test Dummies

   Prototype Dummy Testing
   - Task 11: Build and test prototype dummies
   - Task 12: Dummy NPRM
   - Task 13: Develop and test production dummies
   - Task 14: Procure and test dummies from multiple sources
   - Task 15: Dummy rule

III. Crash Environment Simulator Development Analysis of Test Data
- Task 16: Analyze baseline test results; select alternative test devices/procedures
- Task 17: Conduct tests, specify family of test devices/procedures
- Task 18: Develop family of test devices

IV. Advanced Dummy and Simulator Development Evaluation in Staged Crashes
- Task 19: Evaluate dummies in crash tests
- Task 20: Evaluate test devices/procedures; select compliance tests

V. Development of Integrated Vehicles
- Task 21 - Phase I: Initial specification of vehicles
- Task 22 - Phase II: Preliminary Design and Systems Integration
- Task 23 - Phase III: Develop Testing
- Task 24 - Final Specification of Vehicles
- Task 25 - Phase III: Final Design and Development
- Task 26 - Phase IV: Demonstration and Evaluation Testing

APPENDIX

FEDERAL MOTOR VEHICLE SAFETY STANDARDS

§571.101 Standard No. 101; Control location, identification, and illumination. (Effective September 1, 1969)

This standard specifies requirements for the location, identification, and illumination of motor vehicle controls. The purpose of the standard is to insure the accessibility of motor vehicle controls and to facilitate their selection under daylight and nighttime conditions, in order to reduce the hazards caused by the diversion of the driver's attention from the motoring environment.

§571.101-80 Standard No. 101-80, Controls and displays. (Effective September 1, 1980)

This standard specifies requirements for the location, identification, and illumination of motor vehicle controls and displays. The purpose of this standard is to ensure the accessibility and visibility of motor vehicle controls and displays and to facilitate their selection under daylight and nighttime conditions, in order to reduce the safety hazards caused by the diversion of the driver's attention from the driving task, and by mistakes in selecting controls.

§571.102 Standard No. 102; Transmission shift lever sequence, starter interlock, and transmission braking effect.

This standard specifies the requirements for the transmission shift lever sequence, a starter interlock, and for a braking effect of automatic transmissions, to reduce the likelihood of shifting errors, starter engagement with vehicle in drive position, and to provide supplemental braking at speeds below 25 miles per hour.

§571.103 Standard No. 103; Windshield defrosting and defogging systems.

This standard specifies requirements for windshield defrosting and defogging systems.

§571.104 Standard No. 104; Windshield wiping and washing systems.

This standard specifies requirements for windshield wiping and washing systems.

§571.105-75 Standard No. 105-75; Hydraulic brake systems.

This standard specifies requirements for hydraulic service brake and associated parking brake systems. The purpose of this standard is to ensure safe braking performance under normal and emergency conditions.

§571.106-74 Standard No. 106-74; Brake hoses.

This standard specifies labeling and performance requirements for motor vehicle brake hose, brake hose assemblies, and brake hose end fittings. The purpose of this standard is to reduce deaths and injuries occurring as a result of brake system failure from pressure or vacuum loss due to hose or hose assembly rupture.

§571.107 Standard No. 107; Reflecting surfaces.

This standard specifies reflecting surface requirements for certain vehicle components in the driver's field of view.

§571.108 Standard No. 108; Lamps, reflective devices, and associated equipment. (Effective January 1, 1979, March 1, 1979, July 1, 1979, and October 1, 1979)

This standard specifies requirements for original and replacement lamps, reflective devices, and associated equipment necessary for signaling and for the safe operation of motor vehicles during darkness and other conditions of reduced visibility.

§571.109 Standard No. 109; New pneumatic tires.

This standard specifies tire dimensions and laboratory test requirements for bead unseating resistance, strength, endurance, and high-speed performance; defines tire load ratings; and specifies labeling requirements for passenger car tires.

§571.110 Standard No. 110; Tire selection and rims.

This standard specifies requirements for tire selection to prevent tire overloading.

§571.111 Standard No. 111; Rearview mirrors.

This standard specifies requirements for the performance and location of rearview mirrors. This purpose of this standard is to reduce the number of deaths and injuries that occur because the driver of a motor vehicle does not have a clear and reasonably unobstructed view to the rear.

§571.111-76 Standard No. 111-76; Rearview mirrors.

This standard specifies requirements for the performance and location of rearview mirrors. The purpose of this standard is to reduce the number of deaths and injuries that occur when the driver of a motor vehicle does not have a clear and reasonably unobstructed view to the rear.

§571.112 Standard No. 112; Headlamp concealment devices.

This standard specifies requirements for headlamp concealment devices.

§571.113 Standard No. 113; Hood latch System.

This standard establishes the requirement for providing a hood latch system or hood latch systems.

§571.114 Standard No. 114; Theft protection.

This standard specifies requirements for theft protection to reduce the incidence of accidents resulting from unauthorized use.

§571.115 Standard No. 115; Vehicle identification number. (Effective January 1, 1980, and September 1, 1980)

This standard specifies requirements for a vehicle identification system to simplify vehicle information retrieval and to reduce the incidence of accidents by increasing the accuracy and efficiency of vehicle defect recall campaigns.

§571.116 Standard No. 116; Motor vehicle brake fluids.

This standard specifies requirements for fluids for use in hydraulic brake systems of motor vehicles, containers for these fluids, and labeling of the containers. The purpose of this standard is to reduce failures in the hydraulic braking systems of motor vehicles which may occur because of the manufacture or use of improper or contaminated fluid.

§571.117 Standard No. 117; Retreaded pneumatic tires.

This standard specifies performance, labeling, and certification requirements for retreaded pneumatic passenger car tires. The purpose of this standard is to require retreaded pneumatic passenger car tires to meet safety criteria similar to those for new pneumatic passenger car tires.

§571.118 Standard No. 118; Power-operated window systems.

This standard specifies requirements for power-operated window and partition systems to minimize the likelihood of death or injury from their accidental operation.

§571.119 Standard No. 119; New pneumatic tires for vehicles other than passenger cars.

This standard establishes performance and marking requirements for tires for use on multipurpose passenger vehicles, trucks, buses, trailers, and motorcycles. The purpose of this standard is to provide safe operational performance levels for tires used on motor vehicles other than passenger cars, and to place sufficient information on the tires to permit their proper selection and use.

§571.120 Standard No. 120; Tire selection and rims for motor vehicles other than passenger cars.

This standard specifies tire and rim selection requirements and rim marking requirements. The purpose of this standard is to provide safe operational performance by ensuring that vehicles to which it applies are equipped with tires of adequate size and load rating and with rims of appropriate size and type designation.

§571.121 Standard No. 121; Air brake systems.

This standard establishes performance and equipment requirements for braking systems on vehicles equipped with air brake systems. The purpose of this standard is to ensure safe braking performance under normal and emergency conditions.

§571.122 Standard No. 122; Motorcycle brake systems.

This standard specifies performance requirements for motorcycle brake systems. The purpose of the standard is to ensure safe motorcycle braking performance under normal and emergency conditions.

§571.123 Standard No. 123; Motorcycle controls and displays.

This standard specifies requirements for the location, operation, identification, and illumination of motorcycle controls and displays, and requirements for motorcycle stands and footrests. The purpose of this standard is to minimize accidents caused by operator error in responding to the motoring environment, by standardizing certain motorcycle controls and displays.

§571.124 Standard No. 124; Accelerator control systems.

This standard establishes requirements for the return of a vehicle's throttle to the idle position when the driver removes the actuating force from the accelerator control, or in the event of a severance or disconnection in the accelerator control system. The purpose of this standard is to reduce deaths and injuries resulting from engine overspeed caused by malfunctions in the accelerator control system.

§571.125 Standard No. 125; Warning devices.

This standard establishes requirements for devices, without selfcontained energy sources, that are designed to be carried in motor vehicles and used to warn approaching traffic of the presence of a stopped vehicle, except for devices designed to be permanently affixed to the vehicle. The purpose of this standard is to reduce deaths and injuries due to rear-end collisions between moving traffic and disabled vehicles.

§571.126 Standard No. 126; Truck-camper loading.

This standard requires manufacturers of slide-in campers to affix a label to each camper that contains information relating to certification, identification, and proper loading, and to provide more detailed loading information in the owner's manual. The purpose of this standard is to provide information that can be used to reduce overloading and improper load placement in truck-camper combinations, and unsafe truck-camper matching, in order to prevent accidents resulting from the adverse effects of these conditions on vehicle steering and braking.

§571.127 Standard No. 127; Speedometers and odometers. (Effective September 1, 1979, and September 1, 1980)

This standard establishes requirements for the installation and accuracy of speedometers and odometers in motor vehicles, limits the speed which can be indicated on a speedometer, and requires that odometers be tamper-resistant. The purpose of this standard is to ensure that each motor vehicle is equipped with accurate and reliable instruments needed for monitoring driving speeds, maintaining proper vehicle maintenance schedules, and providing an indication of the vehicle's probable condition.

§571.201 Standard No. 201; Occupant protection in interior impact.

This standard specifies requirements to afford impact protection for occupants.

§571.202 Standard No. 202; Head restraints.

This standard specifies requirements for head restraints to reduce the frequency and severity of neck injury in rear-end and other collisions.

§571.203 Standard No. 203; Impact protection for the driver from the steering control system.

This standard specifies requirements for steering control systems that will minimize chest, neck, and facial injuries to the driver as a result of impact.

§571.204 Standard No. 204; Steering control rearward displacement.

This standard specifies requirements limiting the rearward displacement of the steering control into the passenger compartment to reduce the likelihood of chest, neck, or head injury.

§571.205 Standard No. 205; Glazing materials.

This standard specifies requirements for glazing materials for use in motor vehicles and motor vehicle equipment. The purpose of this standard is to reduce injuries resulting from impact to glazing surfaces, to ensure a necessary degree of transparency in motor vehicle windows for driver visibility, and to minimize the possibility of occupants being thrown through the vehicle windows in collisions.

§571.206 Standard No. 206; Door locks and door retention components.

This standard specifies requirements for side door locks and side door retention components including latches, hingers, and other supporting means, to minimize the likelihood of occupants being thrown from the vehicle as a result of impact.

§571.207 Standard No. 207; Seating systems.

This standard establishes requirements for seats, their attachment assemblies, and their installation to minimize the possibility of their failure by forces acting on them as a result of vehicle impact.

§571.208 Standard No. 208; Occupant crash protection. (Effective September 1, 1981)

This standard specifies performance requirements for the protection of vehicle occupants in crashes. The purpose of this standard is to reduce the number of deaths of vehicle occupants, and the severity of injuries, by specifying vehicle

crashworthiness requirements in terms of forces and accelerations measured on anthropomorphic dummies in test crashes, and by specifying equipment requirements for active and passive restraint systems.

§571.209 Standard No. 209; Seatbelt assemblies.

This standard specifies requirements for seatbelt assemblies.

§571.210 Standard No. 210; Seatbelt assembly anchorages.

This standard establishes requirements for seatbelt assembly anchorages to ensure their proper location for effective occupant restraint and to reduce the likelihood of their failure.

§571.211 Standard No. 211; Wheel nuts, wheel discs, and hub caps.

This standard precludes the use of wheel nuts, wheel discs, and hub caps that constitute a hazard to pedestrians and cyclists.

§571.212-76 Standard No. 212-76; Windshield mounting. (Effective September 1, 1978)

This standard establishes windshield retention requirements for motor vehicles during crashes. The purpose of this standard is to reduce crash injuries and fatalities by providing for retention of the vehicle windshield during a crash, thereby utilizing fully the penetration-resistance and injury-avoidance properties of the windshield glazing material and preventing the ejection of occupants from the vehicle.

§571.213 Standard No. 213; Child seating systems.

This standard specifies requirements for child seating systems to minimize the likelihood of death and injury to children in vehicle crashes or sudden stops by ejection from the vehicle, contact with the vehicle interior, or contact with a child seating system.

§571.214 Standard No. 214; Side door strength.

This standard specifies strength requirements for side doors of a motor vehicle to minimize the safety hazard caused by intrusion into the passenger compartment in a side impact accident.

§571.215 Standard No. 215; Exterior protection—passenger cars.

This standard establishes requirements for the impact resistance and the configuration of front and rear vehicle surfaces.

§571.216 Standard No. 216; Roof crush resistance—passenger cars.

This standard establishes strength requirements for the passenger compartment roof. The purpose of this standard is to reduce deaths and injuries due to the crushing of the roof into the passenger compartment in rollover accidents.

§571.217 Standard No. 217; Bus window retention and release.

This standard establishes requirements for the retention of windows other than windshield in buses, and establishes operating forces, opening dimensions, and markings for pushout bus windows and other emergency exits. The purpose of this standard is to minimize the likelihood of occupants being thrown from the bus and to provide a means of readily accessible emergency egress.

§571.217-76 Standard No. 217-76; Bus window retention and release.

This standard establishes requirements for the retention of windows other than windshields in buses, and establishes operating forces, opening dimensions, and markings for pushout bus windows and other emergency exits. The purpose of this standard is to minimize the likelihood of occupants being thrown from the bus and to provide a means of readily accessible emergency egress.

§571.218 Standard No. 218; Motorcycle helmets.

This standard establishes minimum performance requirements for helmets designed for use by motorcyclists and other motor vehicle users. The purpose of this standard is to reduce deaths and injuries to motorcyclists and other motor vehicle users resulting from head impacts.

§571.219 Standard No. 219; Windshield zone intrusion.

This standard specifies limits for the displacement into the windshield area of motor vehicle components during a crash. The purpose of this standard is to reduce crash injuries and fatalities that result from occupants contacting vehicle components displaced near or through the windshield.

§571.219-75 Standard No. 219-75; Windshield zone intrusion.

This standard specifies limits for the displacement into the windshield area of motor vehicle components during a crash. The purpose of this standard is to reduce

crash injuries and fatalities that result from occupants contacting vehicle components displaced near or through the windshield.

§571.220 Standard No. 220; School bus rollover protection.

This standard establishes performance requirements for school bus rollover protection. The purpose of this standard is to reduce the number of deaths and the severity of injuries that result from failure of the school bus body structure to withstand forces encountered in rollover crashes.

§571.221 Standard No. 221; School bus body joint strength.

This standard establishes requirements for the strength of the body panel joints in school bus bodies. The purpose of this standard is to reduce deaths and injuries resulting from the structural collapse of school bus bodies during crashes.

§571.222 Standard No. 222; School bus passenger seating and crash protection.

This standard establishes occupant protection requirements for school bus passenger seating and restraining barriers. The purpose of this standard is to reduce the number of deaths and the severity of injuries that result from the impact of school bus occupants against structures within the vehicle during crashes and sudden driving maneuvers.

§571.301-75 Standard No. 301-75; Fuel system integrity.

This standard specifies requirements for the integrity of motor vehicle fuel systems. The purpose of this standard is to reduce deaths and injuries occurring from fires that result from fuel spillage during and after motor vehicle crashes.

§571.302 Standard No. 302; Flammability of interior materials.

This standard specifies burn resistance requirements for materials used in the occupant compartments of motor vehicles. The purpose of this standard is to reduce the deaths and injuries to motor vehicle occupants caused by vehicle fires, especially those originating in the interior of the vehicle from sources such as matches or cigarettes.

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